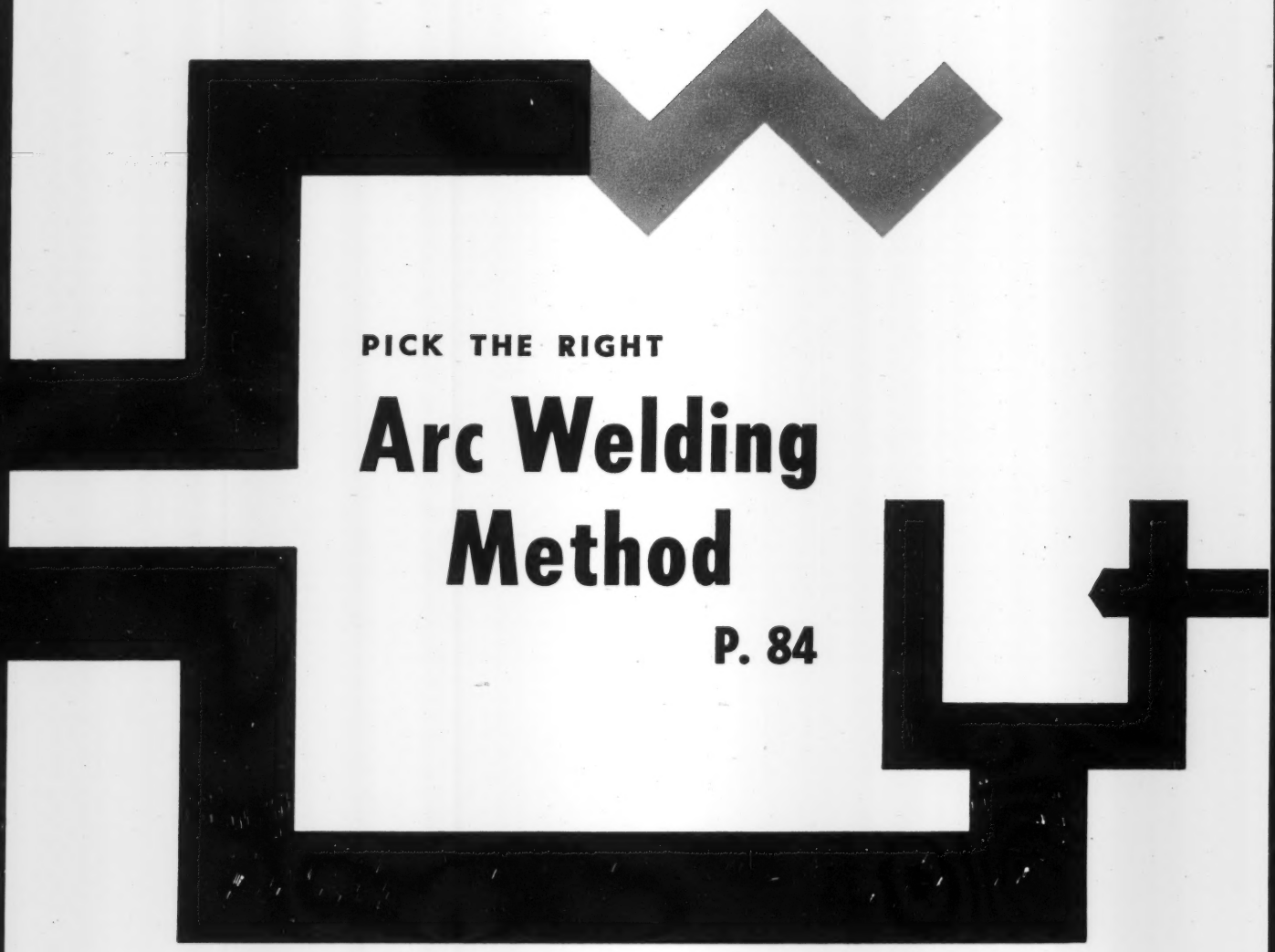
NOVEMBER 23, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



PICK THE RIGHT

Arc Welding Method

P. 84

✓ INDUSTRIAL THANKSGIVING
Land of Plenty Through 1954, p. 43

✓ HOW TO SPOT GOOD HIGH-SPEED STEEL
Compare Your Structures to These, p. 88

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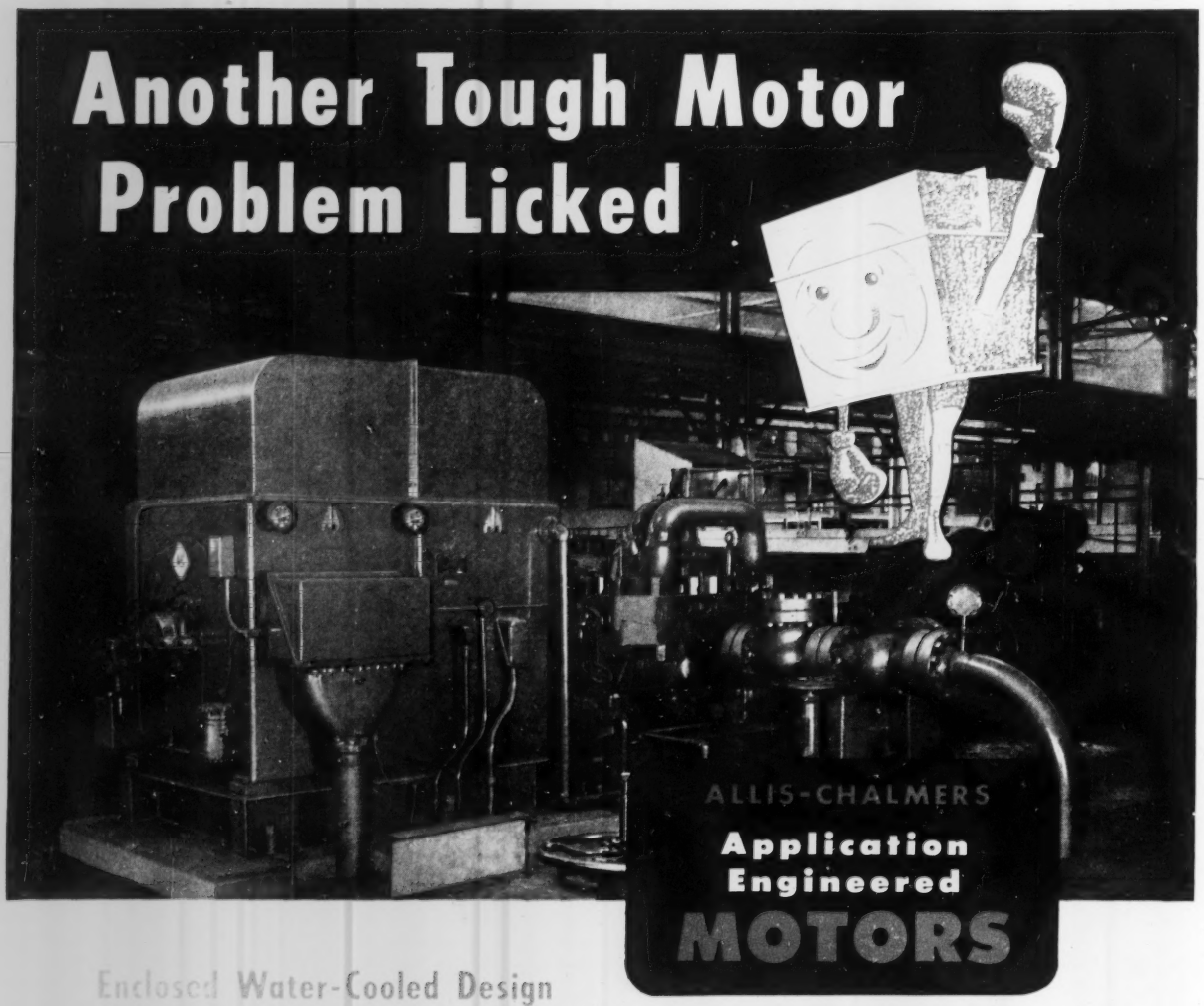
Another Tough Motor Problem Licked



Enclosed Water-Cooled Design Keeps Out Iron Oxide to Cut Maintenance and Add Dependability

In revamping the high pressure water system at the *Gary Steel Works'* 38-inch strip mill, *United States Steel Corporation* engineers encountered a serious problem. For most efficient installation and operation, one of the descaling pumps and its motor belonged right in the mill. But iron oxide from slabs tends to clog air-cooled motors . . . imposing an impractical cleaning schedule on maintenance crews.

Drawing on experience gained in solving a variety of special motor problems, Allis-Chalmers designed the 1500-hp, 6900-volt, 3580-rpm, water-cooled cage motor shown above.

With its totally enclosed design, incorporating an air-to-water heat exchanger, this motor rarely needs cleaning. Moreover, motor life is lengthened and reliability increased because insulation is protected and uniform temperatures are maintained. (For more information about water-cooled motors, ask for Bulletin 05B7682.)

Bring *Your* Motor Problems to A-C

Whether you need a single motor or electrical equipment for a complete rolling mill, Allis-Chalmers can supply equipment to suit the application. So for help in solving your motor problems, contact your A-C representative, or write to Allis-Chalmers, Milwaukee 1, Wisconsin.

A 4164

ALLIS-CHALMERS

Located at Wilshire and Grand, Los Angeles, the Standard Federal Savings and Loan Association building resembles a sheer block of glass. Sealed windows extend in horizontal bands around each floor, separated by continuous spandrels of blue-gray porcelain. Interior columns have been eliminated by means of clear-span steel construction. Deadweight has been reduced with steel floor decking. *Architect:* Welton Becket and Associates. *General Contractor:* C. L. Peck.

9-STORY STEEL FRAMEWORK ERECTED IN TWENTY-NINE DAYS

Structural steelwork for this 9-story Los Angeles office building was completely erected and riveted by Bethlehem Pacific in just 29 working days. This is not necessarily a new speed record, but it is excellent time for a job of this size. It shows how this company is organized and equipped to handle large-tonnage steel construction efficiently and without costly delay to the general contractor or owner.

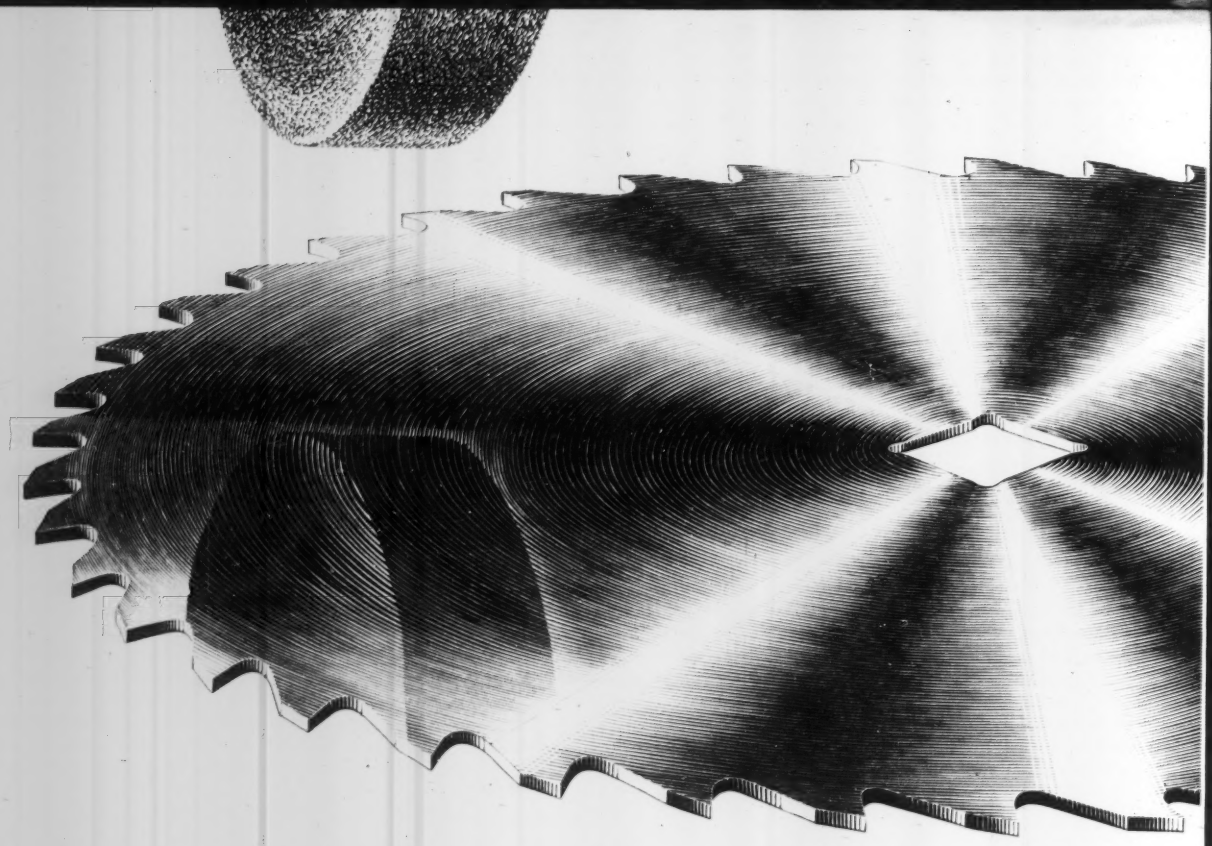
Bethlehem Pacific operates structural-steel rolling mills at Los Angeles, South San Francisco and Seattle; fabricating works at Los Angeles, Alameda, South San Francisco and Seattle; erection equipment depots at strategic localities along the West Coast.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Spokane

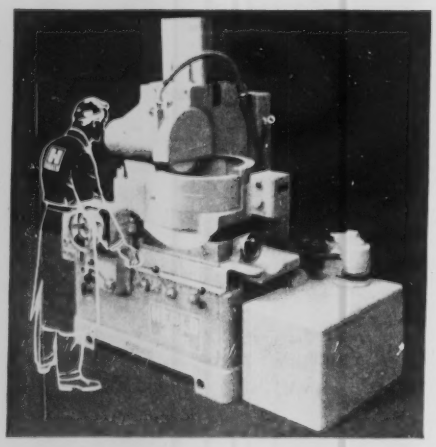
BETHLEHEM PACIFIC

BETHLEHEM STEEL



Saw blades ground

190% FASTER



Grinding the surface of a circular saw blade isn't a complicated operation, to be sure. But accuracy and precision are mighty important to the success of the end product. And minutes saved per part add up to an important reduction in manufacturing cost.

Here's a case where a Heald Model 261 Rotary Surface Grinder did the job 190% faster than by previous methods. The grinding operation is performed automatically, with maximum speed and precision, at the push of a button. Swiveling of the chuck produces a .005″ taper toward the center of the blade. And loading is simply a matter of placing the blade over a center locating pin in the 12″ magnetic gap chuck, with a drive pin between teeth as an extra safeguard against slippage under heavy cuts.

Remember — when it comes to precision finishing, it pays to come to Heald.

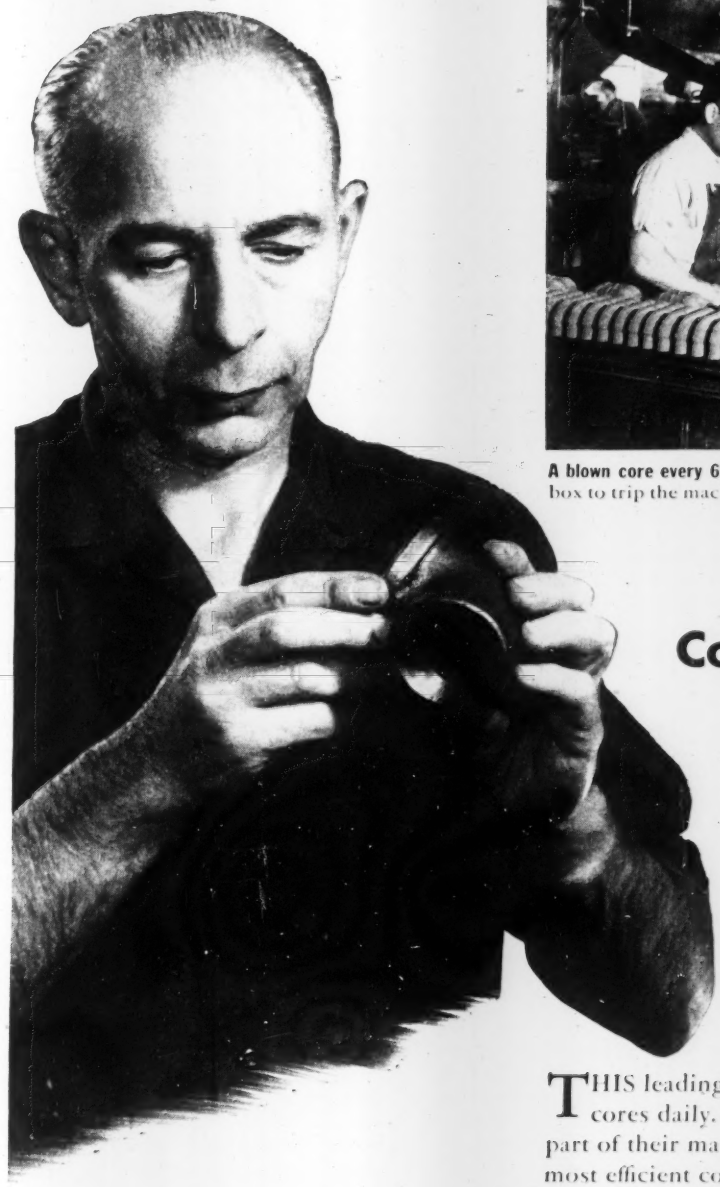
Internal and Rotary Surface Grinding Machines and Bore-Matics

HEALD

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



A blown core every 6 seconds. Now the operator has only to insert core box to trip the machine, starting the automatic core blowing cycle.

Core costs can mean profit or loss in your foundry

THIS leading manufacturer of pipe fittings uses 135,000 cores daily. These cores represent an important part of their manufacturing costs and they need the latest, most efficient core blowing equipment to assure profitable operation in their highly competitive market.

This manufacturer uses 29 Osborn Automatic Core Blowers. The machine-blown cores are *absolutely uniform* . . . core after core. And, best of all, these high quality cores are *produced economically.*

Learn about the new core blowing and molding methods Osborn can put to work for you for lower costs. Write us today. *The Osborn Manufacturing Company, Dept. EE-12, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN

MOLDING MACHINES **CORE BLOWERS**

Another example of Osborn RESEARCH and Advanced Engineering

Eaton Permanent Mold Gray Iron Castings—

for

POWER STEERING

Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

EATON MANUFACTURING COMPANY
General Offices: CLEVELAND, OHIO
FOUNDRY DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

This Week in Metalworking

STEEL

Vol. 133 No. 21 November 23, 1953

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Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $7.50, two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1953 by Penton Publishing Co.

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these outstanding features of
New Luster-on®
COBRA*

The Chromate Finish For Producing Inhibited and Lustrous Finishes on Copper, Brass or Bronze.

- Produces a permanent lustrous finish even in recessed areas.
- Stands over 100 hours standard salt spray
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- Can be handled immediately after treatment cycle no staining or finger marks
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- Inhibited and lustrous finishes on copper, brass or bronze
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Luster-on — the first in the field and still the leader

Write for full data sheets and send a part for free processing

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Make Your Temperature CONTROL More EXACT

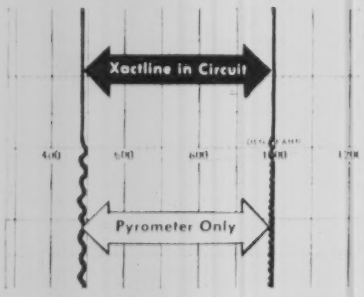
It's Easy with

XACTLINE

and it's automatic . . .

Your present indicating or recording pyrometer controls can be made to function more precisely—minimizing overshooting and undershooting—to meet the closest temperature control requirement.

Simply introducing the XACTLINE into the control circuit will give you this "Straight Line" temperature control. It automatically anticipates temperature changes before they occur—producing a short on-off cycle. Unusually sensitive performance is due to the complete electric operation—no moving mechanical parts. No adjustment or coordination with the control instrument is necessary regardless of the size of the furnace—electric or fuel fired—length of the heating cycle, or size of the load.



Exact reproduction of temperature chart for a heating process showing the comparison of the "Straight Line" temperature control produced by XACTLINE and the saw tooth curve obtained with only conventional control.

PRICE **$89.50** F.O.B. CHICAGO
115 or 230 Volts, 60 Cycle.
Complete installation instructions. 4181

GORDON SERVICE

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Manufacturers • Engineers • Distributors
Metallurgical Testing Machines • Temperature Control Instruments • Thermocouples & Accessories • Industrial Furnaces & Ovens
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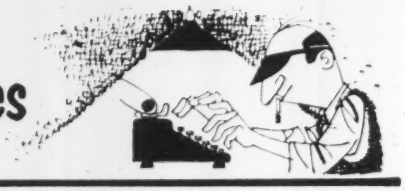
behind the scenes



Aluminum *Uber Alles*

We happened on a little story last week which might bring a bit of a smile to your lips. It concerns D. A. Rhoades, corporation vice president and general manager of Kaiser Aluminum.

It seems Dec. 11, 1951, was a historic day for the metals industry. It was the day of the "first pour" from what was to become the nation's largest aluminum reduction plant. Many representatives of finance, business and the military services journeyed to Chalmette, La., to witness the big to-do.

As mementos of the auspicious occasion, each guest of Kaiser Aluminum was presented with a souvenir ash tray made in the form of an aluminum crucible. Pardon the red faces but, because of the acute metal shortage plaguing the country at that time, the ash trays were made of plastic.

Recently, to announce the completion of this king-sized plant, Mr. Rhoades—a man of long memory and absolute loyalty to his product—sent each guest who attended the "first pour" proceedings an aluminum replacement for the temporary plastic ash tray.

Nice going, Mr. Rhoades.

Job Well Done

A recent letter from H. A. Toulmin Jr. of Toulmin & Toulmin, Dayton, O., asked for a hurry-up order of 5,000 copies of STEEL's Oct. 19 article "Gas Plating Offers Versatility."

This article, in case you missed it, discussed the dry plating process and the fact that it will work with any metallic compound that is capable of being vaporized and that has a decomposition temperature—particularly metal carbonyls.

"When can we expect delivery?" asked Mr. Toulmin. "We have had quite a considerable number of requests—your readers must be live wires."

"The writer who composed this article (Harry E. Chandler) did a magnificent job."

This feature story upon which Mr. Toulmin lavishes such great praise is the type of article we like to think of as being typical of the general run of STEEL material. It was staff-written, of course, and was built out of the raw material sought and developed by a reader-conscious editor. It was written to serve and be useful. We are particularly happy that it is doing just that.

Ever Read the Ads?

We were interested in making a point recently and in order to do it, we studiously read every advertisement in the Nov. 9, 1953, issue of STEEL.

Our objective was to determine how many advertisers in a representative issue offer the reader assistance in the form of bulletins, product literature, samples, special services, etc.

Out of a total of 174 advertisements in that issue, 125, or 70 per cent, offered some sort of "extra" service of the type mentioned above. A total of 77, or 44.2 per cent, offered comprehensive "how it works" type of literature.

STEEL advertisements are an excellent source for valuable engineering and production data. Might be extremely profitable to develop the habit of reading STEEL on an "every-page" basis. Thar's golden information in them thar ads!

Light on the Subject

We put a copy of STEEL in our hip pocket, smudged a little printer's ink on our hands and stuck pencils and copy paper in our various pockets. Thus equipped and camouflaged, we went upstairs to mingle with the editors.

We sidled up to one fellow busy blue-penciling a story on industrial lighting. Reading over his shoulder we saw many a reference to foot-candle.

"What is a footcandle, anyway?" we asked.

Without a pause in his editing, our man said: "It's a unit of illumination—equal to one lumen per square foot or 10.764 luzes or 1.0764 millilphots."

We hastily slunk away. But a look at the story in print found it perfectly understandable and interesting without a line about luzes or millilphots. See for yourself, on p. 54.

Shrdlu

(Metalworking Outlook Page 35)

Wellman will build it

Special Cranes
Ore Bridges
Gas Producer Plants
Charging Machines
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets
Forging Manipulators

Wellman ore bridges

New 577 foot span speeds handling of ore

Wellman 17 net ton ore bridge. Total length 577 feet.

● This new installation, built for one of America's largest steel companies, embodies many engineering features which speed the handling of ore and curtail costs.

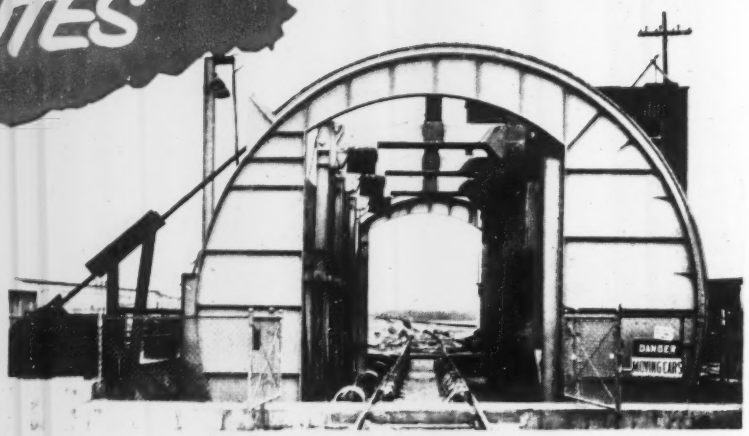
Wellman's more than half-century of experience is at *your* service . . . to engineer and build equipment to improve your operations.

THE WELLMAN ENGINEERING COMPANY

7000 CENTRAL AVENUE · CLEVELAND 4, OHIO

All in a matter of 2 MINUTES

Another 90 tons of coal unloaded by the *Heyl & Patterson* Rotary Car Dumper ...at Fairless Works



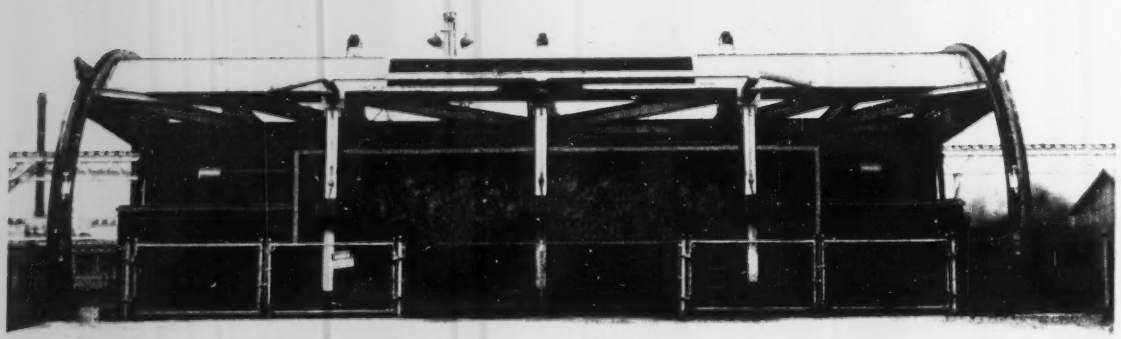
At the Fairless Works of the United States Steel Corporation, all rail shipments of coal, ore and limestone head directly for the new Heyl & Patterson 50 cars-per-hour Rotary Car Dumper. Here a 90-ton capacity railroad car is pushed onto the dumper, overturned to unload the contents, returned to an upright position and pushed off the dumper . . . all in a matter of two minutes.

The Rotary Dumper at Fairless Works features a self-contained clamp-setting mechanism located on the dumper structure proper. This more compact installation eliminates the need of separate counterweight structures.

Cars can be spotted perfectly by the operator on this Heyl & Patterson Dumper through the use of air-operated car retarders, eliminating the necessity of personnel entering the dumper structure.

If the problem at your plant is unloading large quantities of coal, ore or any Heavy Bulk Material quickly and economically . . . investigate the many engineering, operating and maintenance advantages of Heyl & Patterson Rotary Car Dumpers.

When your problem concerns the loading, unloading, transferring, stocking or conveying of any Heavy Bulk Material . . . remember the Engineering, Fabrication and Erection facilities of Heyl & Patterson. These facilities enable Heyl & Patterson to take complete responsibility for the entire job.

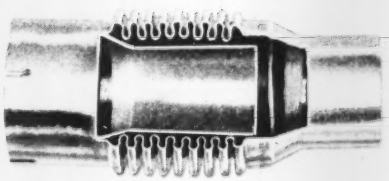


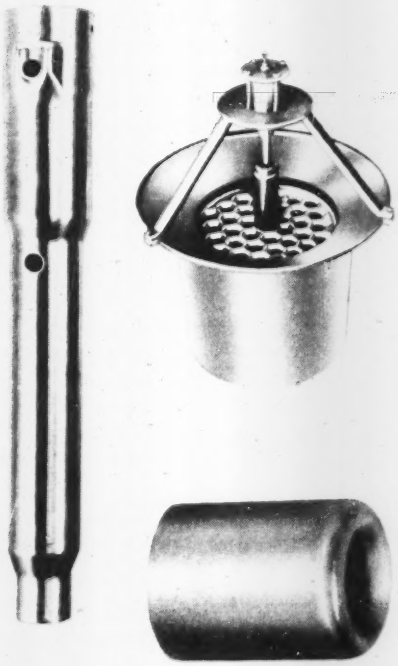
Heavy Bulk Materials Handling Equipment *All The Way from Design to Erection*

High Lift-Turnover-Rotary Railroad Car Dumpers
Boat Loaders and Unloaders
Ore Bridges
Coal Handling Equipment
Pig Iron Casting Machines
Cyclone Thickeners
Thorsten Coal Samplers
Car Hauls and Boat Movers
Coal Crushers
Bradford Breakers

Heyl & Patterson, Inc.
"SINCE 1887"
55 FORT PITT BLVD. PITTSBURGH 22, PA.

How to Design for More Product Efficiency





In the column at the left you'll see a few parts that may help you in your next design job. They demonstrate, somewhat, the possibilities of "design freedom" that come when you design with Carpenter Stainless Tubing in mind, because they show that modification of design to achieve economical working or fabrication is unnecessary when you specify "Carpenter".

In short, Carpenter stainless gives you those working properties that make for easy fabrication and low reject rate even when severe drawing, swaging, flanging or upsetting are required. In addition, Carpenter is delivered "as specified" in analysis, dimension, finish, tolerance and temper, piece after piece, order after order. It does not vary in quality.

Why not design the cost-saving advantages of Carpenter tubing into your products. Call your nearest Carpenter representative—and prove for yourself that there is no "or equivalent" for Carpenter quality in stainless tubing.

The Carpenter Steel Company, Alloy Tube Division, Union, N.J.

Branch Offices: Atlanta Chicago Pittsburgh Houston Newark San Francisco

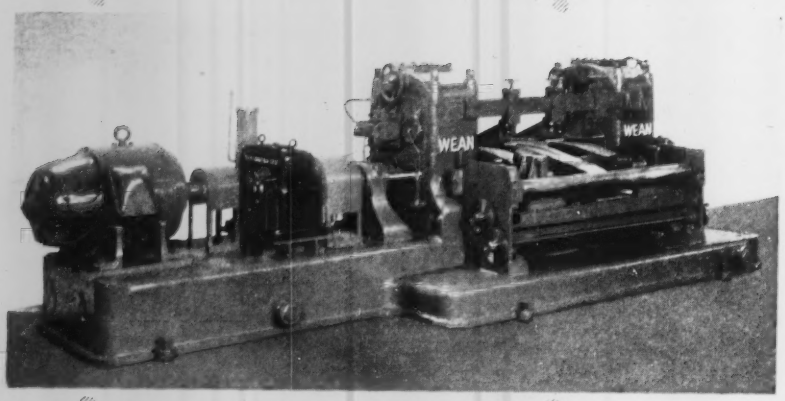
Export Dept.: The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

Carpenter

STAINLESS TUBING & PIPE

· Analysis · · Tolerance · · Finish ·

- guaranteed on every shipment



H & S SPEED REDUCERS play a part

in side trimming

strip steel at

high speeds

• Cutting strip steel at high speeds is a tough job and Horsburgh & Scott Speed Reducers play an important role as part of the Wean Side Trimmers . . . available in various sizes for edge trimming hot and cold rolled strip from .006" to ⅜" thick. This is only one of the many fields in industry where H & S Speed Reducers are handling tough jobs for long uninterrupted periods with great savings in maintenance. It will pay you to talk with our engineers about your speed reduction problems.

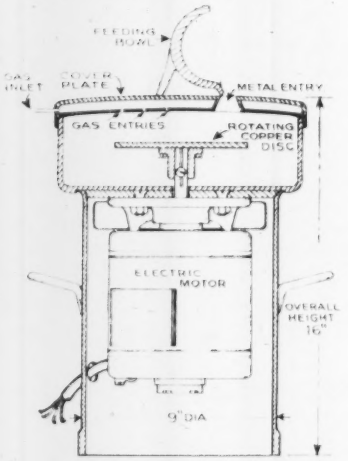
THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

Snappy Sampling Device



With reference to your story "British Productivity Booster" (Nov. 2, p. 49), will you please advise whom we can write for further information on the rotary metal sampling device described.

W. A. McKeen
chief metallurgist
Firth Sterling Steel & Carbide Corp.
Pittsburgh

• *The rotary metal sampling device was developed by Westberg Developments Ltd., Rotherham, England, in conjunction with the British Steel Castings Research Association. Westberg Developments is now manufacturing and marketing the device.—ED.*

Scrapbook for Supers

I should be very grateful if you would send me a sample copy of the "Scrapbook for Supervision" as described in your article "Your Key to Good Plant Discipline: The Foremen" (Aug. 24, p. 49).

A. A. Atkins
education officer
Samuel Fox & Co. Ltd.
Sheffield, England

• *Write to the National Foreman's Institute, New London, Conn.—ED.*

Word Gets Around

I have heard reference to your article "Push Button Weather from Heat Pumps" (Sept. 21, p. 86). I would like a tear sheet of that article.

Curtis Morris
American Gas Association
Washington

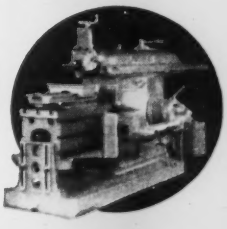
• *Sent.—ED.*

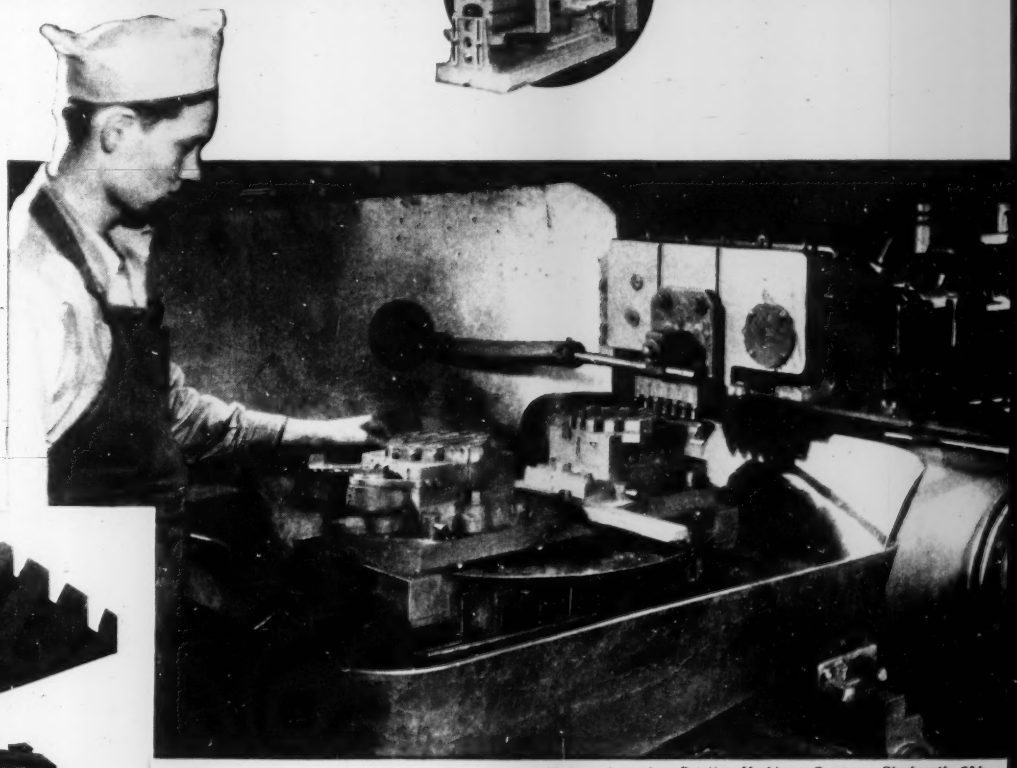
More on Motor Rerating

In the Sept. 21 issue of STEEL an article appeared entitled "Bigger Inside, Smaller Outside" (p. 128). This article pertained to a rerating program of the National Electrical Manufacturers Association. Are there any circulars or bulletins published which will give us a

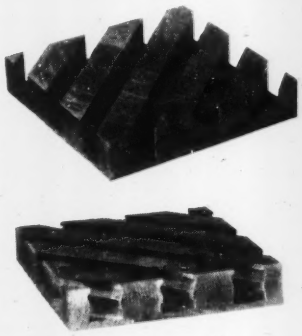
Please turn to p. 12

90 pieces per hour

...on this CINCINNATI  SHAPER



Photograph courtesy Printing Machinery Company, Cincinnati, Ohio.



Work piece is a malleable iron, Warnock diagonal block. Production, 90 per hour. Special designed gang tool holder carries six form ground high-speed tools.

This production job on a special Cincinnati Shaper is finished in one completely automatic cycle. Both initial cost and tooling costs are low.

The operator starts the Shaper; the head automatically feeds nine strokes to the right, nine to the left and stops. The operator indexes the fixture and the cycle repeats. Loading and unloading is done without interruption to cutting.

Write for
Shaper Catalog N-6.

Consult us on your shaping jobs. A special Shaper may be very profitable to you.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

ORTON
Torque-Control
MEANS
POWER CONTROL
WEAR CONTROL
• NO JERKING, slip-clutching or racing engines!
• CUSHIONED SHOCK—only the *exact* amount of power needed to move the load!
SEND FOR CATALOG 84
ORTON CRANE AND SHOVEL COMPANY
608 SOUTH DEARBORN STREET • CHICAGO 5, ILLINOIS
• PATENTED

LETTERS

Concluded from p. 10

complete picture of the rerating program.

G. W. Weiss
Morse Chain Co.
Detroit

• *NEMA can supply complete material on the general rerating program. Most motor manufacturers have prepared bulletins giving specific data on their own motor lines.—ED.*

Why No Stainless Pipe?

We find your "Guide for Stainless Steel Buyers" (Section II, June 22) very helpful. We are wondering though why you left out stainless steel pipe from this listing.

Herbert E. Corby
Norwalk Tank Co., Inc.
South Norwalk, Conn.

• *The "Guide for Stainless Steel Buyers" did not include stainless steel pipe because the amount of work in compiling such a guide made it necessary to confine the guide to selected products. We tried to select the products that would be of greatest interest to the metalworking field. A big producer of both stainless tubing and stainless pipe told us that the footage of stainless tubing sold far exceeds the footage of stainless pipe sold. Consequently, we listed tubing but not pipe.—ED.*

Management Series Rolls On

I have just read your article "Selecting the Right Materials for the Job" (Oct. 12, p. 129) No. 8 in STEEL's Program for Management. I would appreciate receiving the seven previous articles in this series.

E. R. Landry
General Sales Department
Industrial Products
National Carbon Ltd.
Toronto, Canada

• *Sent.—ED.*

We would like to get ten copies of "Selecting the Right Materials for the Job."

Paul W. Richardson
Engineering Department
Kiekhaefer Aeromarine Motors, Inc.
Fond du Lac, Wis.

• *They're being sent. A limited number of reprints of this article are available from STEEL's Reader Service Department.—ED.*

Plating Story Goes Abroad

We have been very interested in your article "Gas Plating Offers Versatility" (Oct. 19, p. 120) and would like your permission to reprint it in full.

Robert Pinner
Electroplating
Teddington, England

• *Permission granted.—ED.*

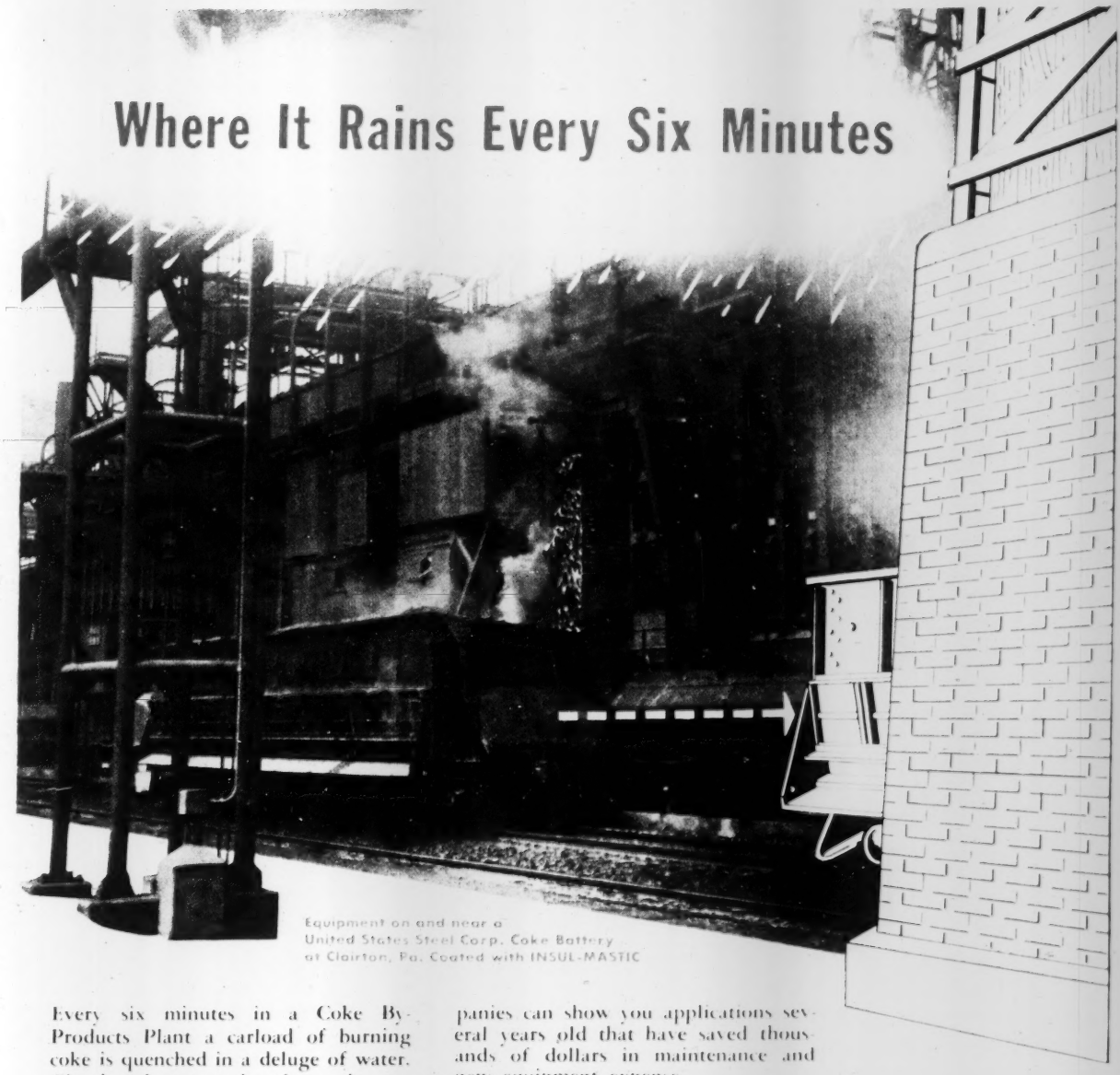
All About NTDMA

Your article "More for the Money" (Nov. 2, p. 44) was a fine story on the annual meeting of the National Tool & Die Manufacturers Association. We would like to have three or four tear sheets of this page.

Marvin Reese
581 Fifth Ave.
New York

• *Sent.—ED.*

Where It Rains Every Six Minutes



Equipment on and near a United States Steel Corp. Coke Battery at Clairton, Pa. Coated with INSUL-MASTIC

Every six minutes in a Coke By-Products Plant a carload of burning coke is quenched in a deluge of water. Clouds of steam rise from the car causing a corrosive industrial atmosphere.

Corrosion was severe until steel mills and chemical companies began to coat their metal equipment with INSUL-MASTIC. Now, some of these companies can show you applications several years old that have saved thousands of dollars in maintenance and new equipment expense.

Acids, alkalis, rain and sun will not appreciably shorten the life of the heavy INSUL-MASTIC Bituminous Coatings. Years after they have paid for themselves they will still prevent corrosion. They also Vaporseal Insulation, Waterproof and Insulate.

For a neat looking plant, resurface old masonry buildings with INSUL-MASTIC and Colored Stone Granules.

Write today for the book, "INSUL-MASTIC IN INDUSTRY".

Think First of the Coatings that Last!

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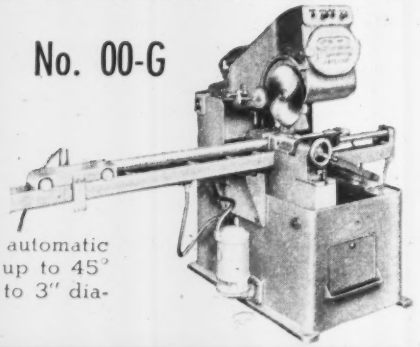
. . IT'S THE Cost per Cut THAT Counts

Study these high production, low cost figures on three Motch & Merryweather Circular Sawing Machines

Make your own study of the cost per cut in your metal-sawing department. Then find out from Motch & Merryweather how much production at lower cost you can get on M. & M. Circular Sawing Machines, using our Triple-Chip blades.

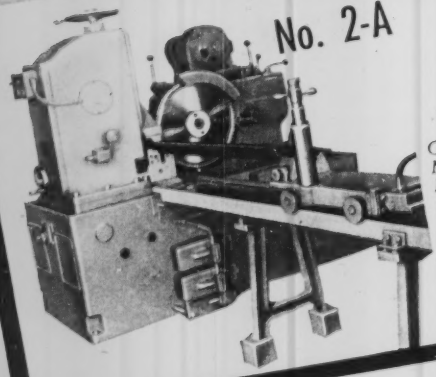
Operation: Steel door frames (mitre cut).
Material: Rolled steel shapes 6" wide x 1 16" thick.
Production: 200 pieces per hour.
Tool cost per piece: $.0002.

No. 00-G



M. & M. No. 00-G Circular Sawing Machine. Manual or automatic stock feed. Readily adaptable to making cuts at angles up to 45° as well as high production square cut-off. Capacity: up to 3" diameter round; shapes—up to 3-3/8" x 6".

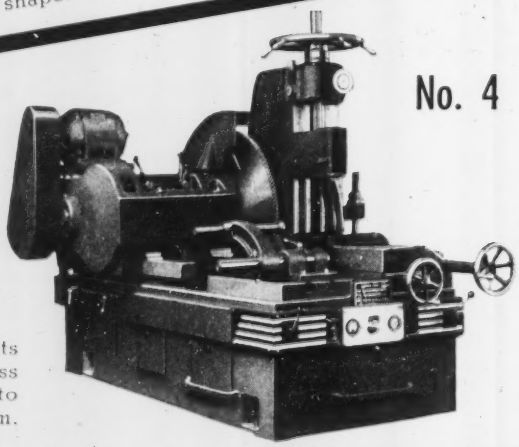
No. 2-A

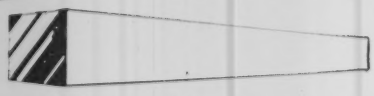


Operation: Rocket nozzle stock cut to length.
Material: S. A. E. 1020, 5" diameter.
Production: 60 pieces per hour.
Tool cost per piece: $.001.

The No. 2-A machine pictured at the left has automatic stock feed up to 72" cut-off lengths. It is offered also with manual stock feed. Capacity: up to 6-1/2" diameter round; structural shapes—up to 5" x 12".

No. 4





Operation: Forging billets cut to length.
Material: S.A.E. 1045, 14" square.
Production: 6 pieces per hour.
Tool cost per piece: $.12.

No. 4. Widely used in steel and structural steel plants and forge plants sawing all types of forging, stainless and titanium alloys, die block steel, etc. Capacity: to 17" dia. round; structural shapes up to 24" I-beam.

Complete size range, ferrous or non-ferrous, up to 43" diameter.

Manufactured by —THE MOTCH & MERRYWEATHER MACHINERY CO.—
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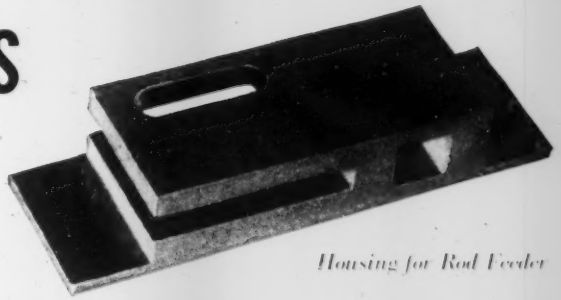
Builders Also of Production Milling, Vertical Turning, Automatic and Special Machines

Only M & M builds ALL 3: CIRCULAR SAW SAW BLADE BLADE GRINDER

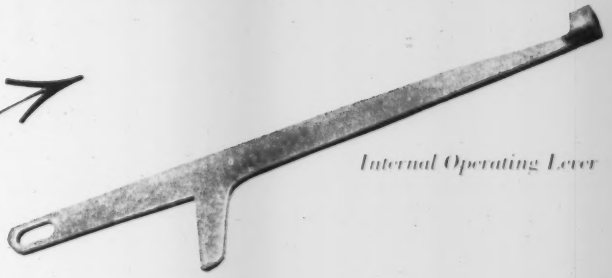
PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

These Intricate Parts are



Housing for Rod Feeder

ECONOMICALLY TO CLOSE DIMENSIONS



Internal Operating Lever

These two parts—vital to a starting-rod feeder for a hand-scarfing blowpipe—are produced in quantity by HAYNES precision-investment casting. Both parts are too intricate in shape for accurate production by conventional casting methods. And since they are made from stainless steel, the cost of machining the parts in quantity would be prohibitive.

HAYNES precision casting is an ideal method for mass-producing parts that must be made from an alloy difficult to fabricate into intricate shapes by ordinary methods. Sound, smooth castings are produced to such close dimensional standards that the need for finishing operations is minimized. For more information on the types of parts best suited to this process, and for tips on designing parts to be cast by this method, write for the booklet, "Investment Castings."

The efficiency of the starting-rod feeder on this hand-scarfing blowpipe is partly due to the use of HAYNES *investment castings for the critical parts of the assembly.*

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Haynes Stellite Company
A Division of
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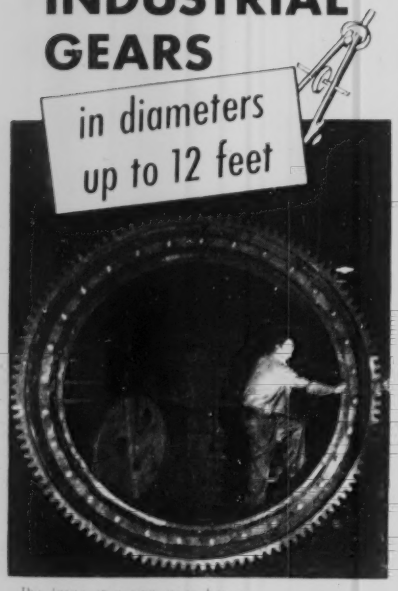
Heavy-Duty INDUSTRIAL GEARS

in diameters up to 12 feet



This large spur ring gear has a diameter of 12' 2", with a total of 144 teeth.

Simonds CUT Gears

Spur · Bevel · Mitre · Worm
Worm Gears · Racks · Pinions

For big heavy-duty industrial gears, made of all materials, call on Simonds. Backed by a 60-year reputation for dependability, Simonds is equipped right to match your most exacting specifications . . . geared right to give you fast delivery and custom service. Simonds regularly produces spur gears in diameters up to 12', worm gears to 6', bevel and mitre gears to 5'.

SIMONDS GEARS

SIMONDS also is stock carrying distributor for Ramsey Silent Chain Drives and Couplings; and industrial V-Belts.

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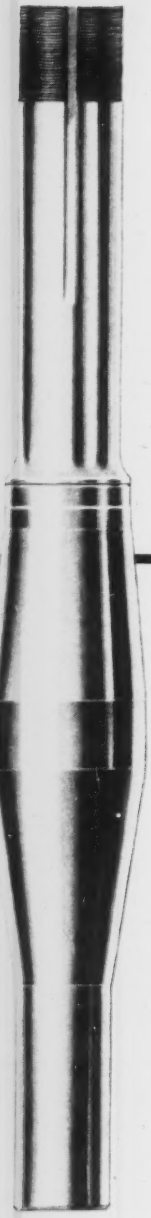

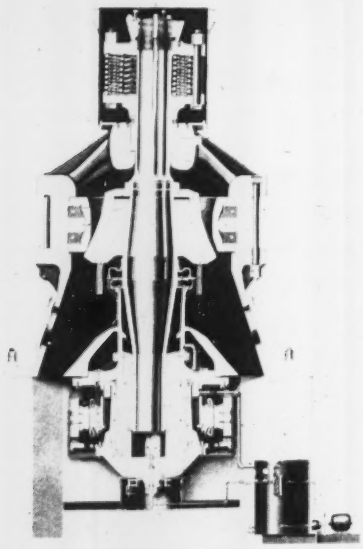

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"A matter of great importance when contracting for the purchase of forgings is the problem of getting deliveries. We have found when Standard Steel Works, as contractors, make a promise of delivery, it is very dependable, and this is extremely important to us."

In addition they have found the analysis and quality of the steels used in Standard Steel forgings and castings contribute to most dependable performance records.

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ONE OF SIX REASONS why you should always call Standard Steel for forgings and castings.

1 Quality Steel—through production of own steel by acid process.

2 Uniformity—assured by precise control of forging and rolling operations.

3 Fast Service—a vital factor in the continuing growth of Standard Steel for over 150 years.

4 Testing—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

5 Capacity—unsurpassed ability to produce forgings and castings of unusual sizes and shapes, such as weldless rings all the way up to 144" O.D.

6 Experience—produced by skilled workmen with 20 to 40 years experience.

For more information write Dept. 8746

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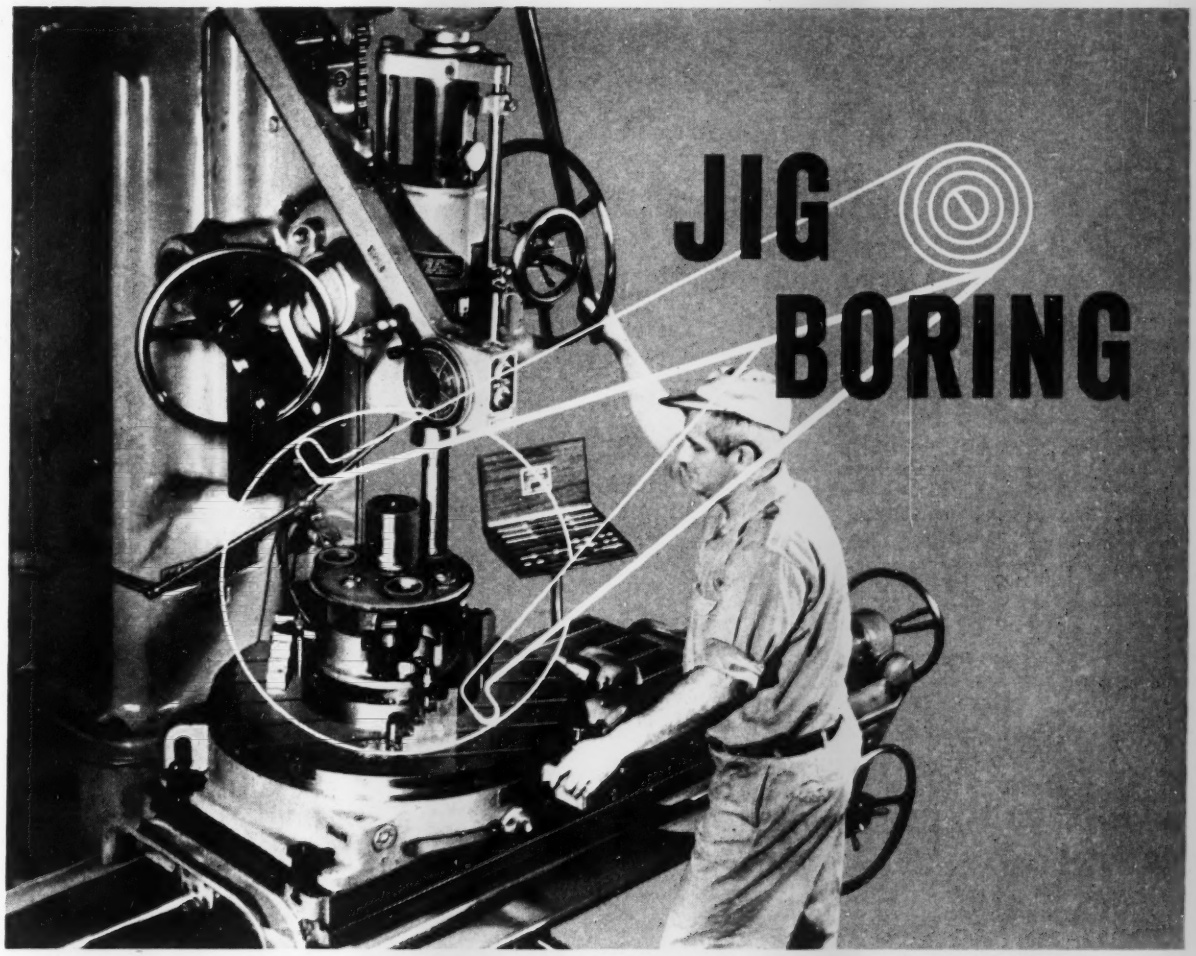

Mention jig boring to a craftsman machinist and he thinks instantly of "extreme" precision. And that's exactly what it is—an operation which finishes an ordinary machined surface to a micro-precision tolerance. The accuracy of jig boring is required on only a small percentage of gears, but BRAD FOOTE is in a position to produce this accuracy when required.

• Jig boring is another of the wide variety of manufacturing methods employed by BRAD FOOTE to make gears exactly right for you and each of our many other customers.

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• Send us your specifications for prompt quotation. Or, tell us the job that the gears must do and we'll design them for you. We'd like to do business with you, and we think you'll like doing business with us.

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The **JARECKI** "Giants for Hire" include Clearing, Danly, Bliss, Cleveland, Hamilton, Verson, and Niagara presses ranging from 25 to 1200 ton capacity. These presses are capable of producing the largest and the smallest parts used in the automotive and appliance industries.

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GRADES:
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B & L C-1212
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High-Sulphur
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Screw Steel

B&L pioneered the original research in the development of this type of Cold Finished Open-Hearth Carbon Bar Steel. We have produced many thousands of tons, and such tonnage has been carefully followed through manufacturing procedures; has been subjected to extensive metallurgical investigations, and thoroughly checked by our Field Engineers for machinability and overall uniform quality at the plants of our customers, where this steel has been fabricated during the past several years.

The B&L C-1200 series steel has proven to be at least equivalent in machinability to the somewhat comparable B-1100 Bessemer screw stock grades and, since the 1200's are made by the Open-Hearth practice, they comprise a much larger tonnage per melt. This results in markedly greater uniformity, as compared with the small Bessemer melts. The C-1200 grades have identically the same chemical analyses ranges as those of the similar B-1100 grades, and the grade extras are also fully comparable.

The modern type of C-1200 steels are available in a fairly complete range of sizes in Rounds, Hexagons, Squares and Flats. Therefore, if you have not as yet used any of this steel, we know that a trial will convince you of its outstanding quality and uniformity.

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BRYANT proudly introduces the newest member of the Bryant family of precision machines — the Bryant 998 Boring Machine — a production machine for precision boring, drilling, turning, facing, grooving and contour turning and boring where fine finish and rapid production are desired.

The Bryant 998 can be tooled either as a single purpose machine for quantity production or for miscellaneous work on small lots. Because it is all-mechanical, its cycle is positive and constant.

Smooth, uniform motion of the table and freedom from vibration, so essential to generating a fine finish with a single point tool, are assured by the 998. Its bed, bridge, heads and table are Meehanite castings. The table moves on preloaded ball bearing slide bars and is mechanically actuated by a simple cam and lever unit. Cam and change gears are easily accessible for changing either the length of stroke or the rate of travel. The motors for driving the cam and the boring heads are mounted in an accessible cavity inside the bed, thus keeping floor space to a minimum. This cavity is fan ventilated.

Ample fixture mounting surface is provided by the table, which measures 17½" x 22". The table has three ⅝" T-slots, and will accommodate a wide variety of fixtures. Machined setup pads are provided on the bridge for ease in locating fixtures.

The design of the Bryant 998 takes full advantage of standard purchased parts. Brakes, motors, air cylinder, bearings, pneumatic follower system, lubrication hoses and all electrical apparatus are stock items. Either low or high pressure coolant systems are available. All electrical equipment conforms to J. I. C. standards.

BORING MACHINE

Design

- The bed, bridge, table and heads are normalized Meehanite castings.
- The cam actuated table moves on preloaded ball slide bars.
- The cam is hardened and ground.
- The boring head spindles rotate in preloaded super-precision ball bearings. A graduated spindle nose and eccentric bushing for tool setting are standard.
- An air cylinder opposes the work table motion directly with constant pressure and keeps the cam follower roll and the cam always in contact.
- The boring head drive is completely accessible and is designed for long life.
- The cam drive assembly is protected by a torque limiting clutch.
- Cycle time is controlled by precision change gears in the cam drive gear box.
- An ample pad is provided at the rear of the machine for mounting accessory equipment.

Operation

- Push button controls are conveniently located on a panel at the front of the machine.
- Cycle can be manual, semi-automatic or fully automatic.
- An emergency stop button will instantaneously interrupt the cycle.
- Jog buttons are located on both the front and the rear of the machine for setup purposes.
- Machined setup pads are provided on the bridge for ease in locating fixtures.

Maintenance

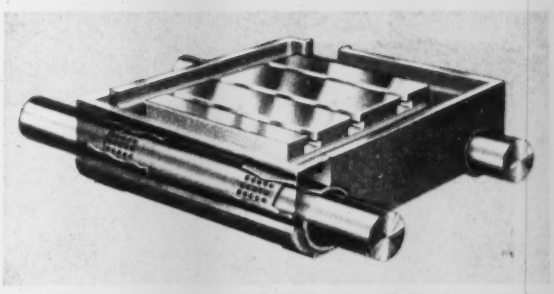
Maintenance is necessary at only three points: two grease fittings on the cam follower assembly and cleaning and lubricating of the filter-lubricator unit in the pneumatic system.

- The ball slide table is grease sealed.
- Gear box has its own closed lubrication system.
- The boring head bearings are permanently grease sealed.
- The cam is easily accessible for changing the table stroke. It is taper mounted and keyed to the drive shaft to ensure ease of changing and accurate mounting.
- The change gears are enclosed in their own wet sump, splash lubrication system.
- Brakes, motors, air cylinder, bearings, pneumatic follower system, lubrication hoses and all electrical apparatus are standard purchased parts.

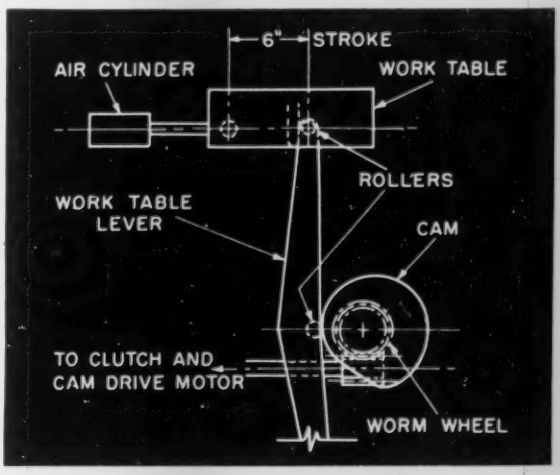
Write today for complete information and specifications!

BRYANT Chucking Grinder Company
Springfield, Vermont, U. S. A.

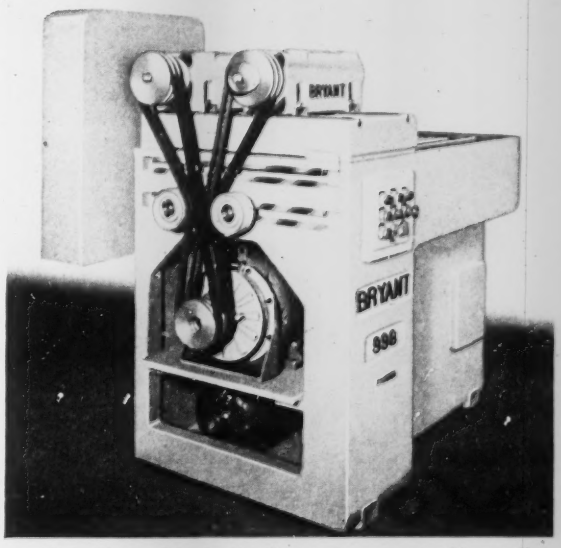
Internal Grinders, Internal & External Thread Gages, Granite Surface Plates, Boring Machines



Smooth response of the table is ensured by the special Bryant slide bar design. Each bearing is a hardened steel sleeve containing numerous ⅜" diameter preloaded balls. This provides a metal-to-metal contact which resists forces in all directions and transmits stresses directly to the bed.



The table is actuated by an inexpensive, quick-change cam working through a follower and lever arm. An air cylinder opposes the work table motion, keeping the cam follower and the cam always in contact to completely eliminate back-lash and jump.



Cam drive and boring head motors are mounted in a well ventilated cavity in the bed.

"We expect

20 years of service or *more*

from these American Quality Springs"

...says SIMMONS COMPANY

World's largest producer of sleeping equipment

EVERY housewife in America knows that the name *Simmons* is an ironclad guarantee of quality when it appears on a mattress or sofa.

If you visited any of the 7 Simmons factories, you'd know why. Simmons has built an unparalleled reputation by *insisting* on fine workmanship and highest quality component parts.

Look at the famous Hide-A-Bed shown here. You don't have to yank and pull to open it into a comfortable bed. It glides open easily on 6 counter-balance American Quality Springs. Each of these 9-inch springs must withstand a stretch to 15 inches. In a 20-year period, these 6 helical springs are stretched to the limit 14,600 times.

We produce these springs for Simmons using a high-grade oil-tempered wire. As a result, the finished springs meet very close load tolerances, and they are consistently straight.

If you need a typewriter spring, an automobile axle spring, or a spring to support a giant locomotive, American Steel & Wire will help you design it. Then we'll produce it—any size, any grade of steel, any shape, any finish. You'll get all this at a price you never thought possible.

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UNITED STATES STEEL

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in considerable quantities, you undoubtedly have asked yourself: "Couldn't we profitably *make* it ourselves?"

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The new Yoder Tube Mill Book discusses these and other pertinent subjects. It's a realistic story of one of the most interesting developments in modern metal working . . . a development which started only 15 years ago, with the introduction of the amazingly efficient new Yoder electric resistance tube welder with rotating transformer.

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- ★ PIPE and TUBE MILLS–cold forming and welding

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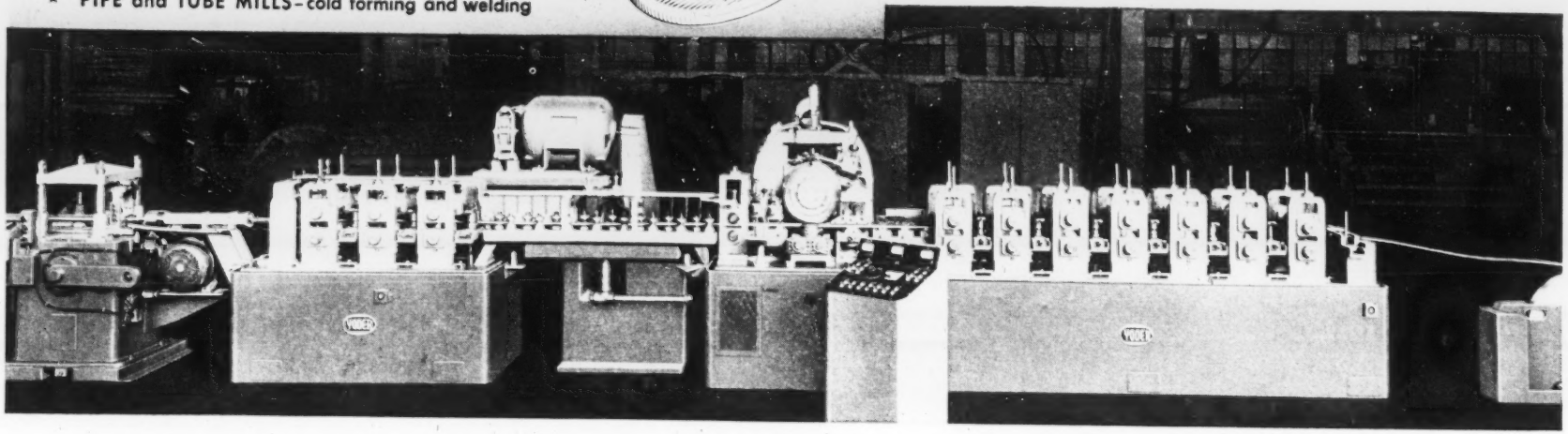
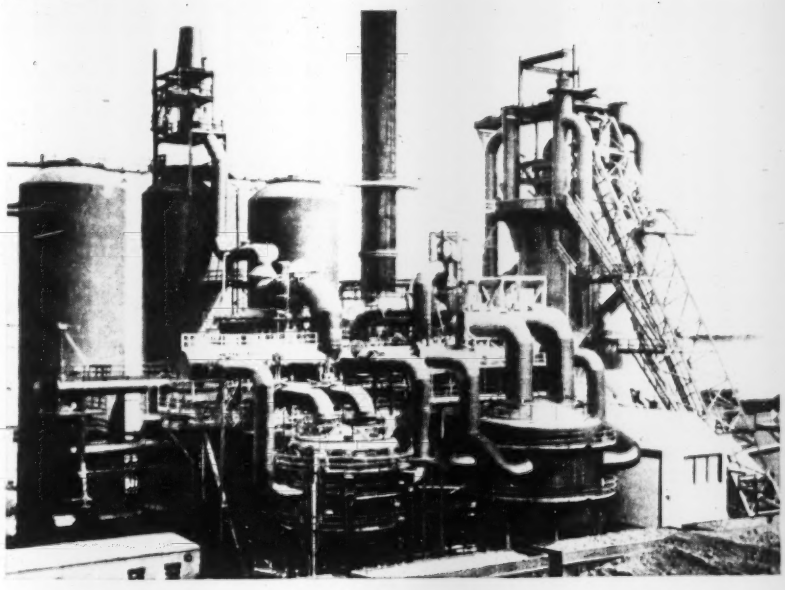


(Advertisement)



How Cottrell Precipitators Clean Gas in the Steel Industry

Iron Ore Sintering Plants

The first commercial Cottrell installation for cleaning gases coming from the iron ore sintering machines was placed in operation in 1952 with collection efficiencies exceeding 95%. In this installation the gases leaving the windboxes of the sintering machine pass to a flue, then to a mechanical collector, to the induced draft fans, to the precipitator, and then to stack. The gases enter the precipitator at temperatures of about 250 to 300F, with water vapor content of about 8%. The dust collected is dry and quite fine. The precipitators used on this application are of the horizontal steel plate type.

Iron Blast Furnaces

The cleaning plant in most iron blast furnace installations consists of the preliminary stage (dry dust catchers), the primary stage (water scrubbers) and the secondary stage (water-flushed Cottrell Precipitators). Dust and fume content of the gas is reduced to the range of 0.1 to 0.3 grains per cubic foot of gas corrected to standard conditions before it reaches the Electrical Precipitator. The function of the precipitator is to further clean this gas to a final dust content ranging in most cases from 0.005 to 0.01 grains per cubic foot, depending on how the gas is to be used.

Open Hearths

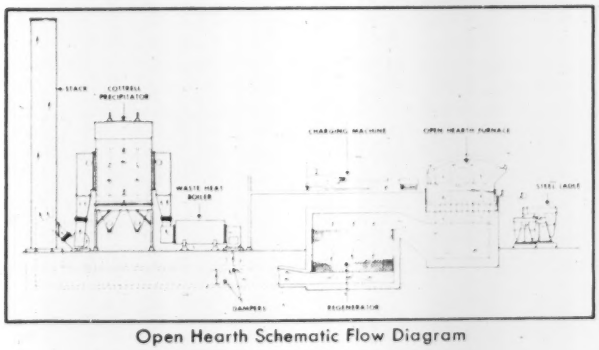
This problem involves the cleaning of combustion gases coming from furnaces, usually oil-fired, and carrying in suspension a heterogeneous mixture of very fine metallic oxides.

After extensive research and pilot plant studies, Research Corporation completed the first commercial precipitator installation for cleaning open hearth gases in 1951. Test results at rating indicated efficiencies of over 95% were obtained. Most of the time there was no visible discharge.

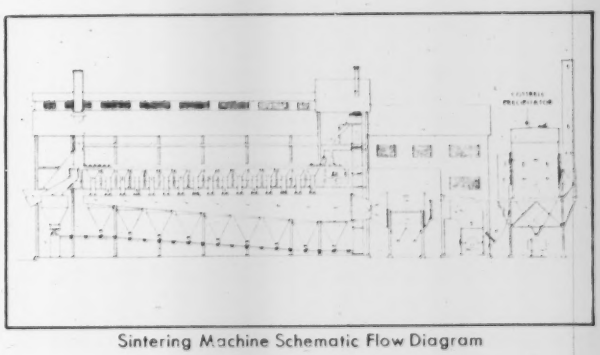
Other Steel Applications

In addition to the above, Research Corporation Cottrell installations are being used for detarring by-product coke oven gas, cleaning oven fuel gas and producer gas, and cleaning ferromanganese blast furnace gas.

Detailed information on all these applications is available through your nearest Research Corporation office.



Open Hearth Schematic Flow Diagram



Sintering Machine Schematic Flow Diagram

RESEARCH CORPORATION

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RC145

The Singer Class 253 high-speed, two-thread chain-stitch industrial sewing machine operates at speeds up to 5,500 stitches per minute. It is used by manufacturers of shirts, bathing suits, blankets, uniforms, coats, flags, etc.

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MEETS LOW POROSITY CASTING REQUIREMENT WITH CHATEAUGAY PIG IRON

Low porosity is an important requirement in the arm casting for the Class 253 industrial sewing machine manufactured by The Singer Manufacturing Company. The machine is equipped with a fully automatic lubrication system that pumps oil under pressure to principal bearings. The inside of the casting is constantly bathed in oil which would soak through a casting of higher porosity.

To get a dense, strong casting with low porosity and high wear resistance the Singer Company uses Chateaugay, Republic's exclusive premium Pig Iron in their cupola mixture. Chateaugay shrinks evenly, fills adjoining light and heavy sections completely, produces an unusually fine and uniform grain structure. Chateaugay castings machine readily and economically.

A Republic Pig Iron Metallurgist will be glad to give you the complete story on Chateaugay, the low phosphorus, copper-free Pig Iron. There's no cost or obligation for his services.

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"REPUBLIC" (Northern) Foundry, Basic and Malleable

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(The Handy Hamilton Portable Elevating Table)

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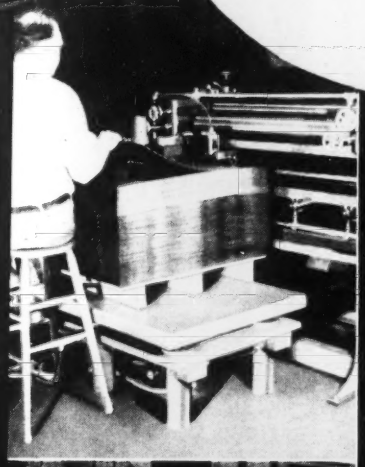

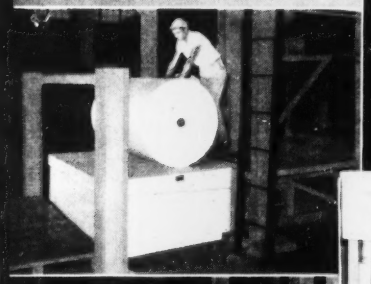

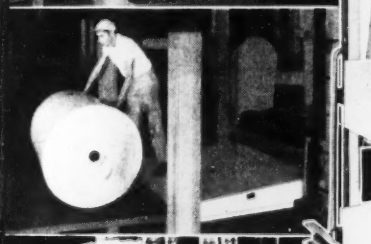

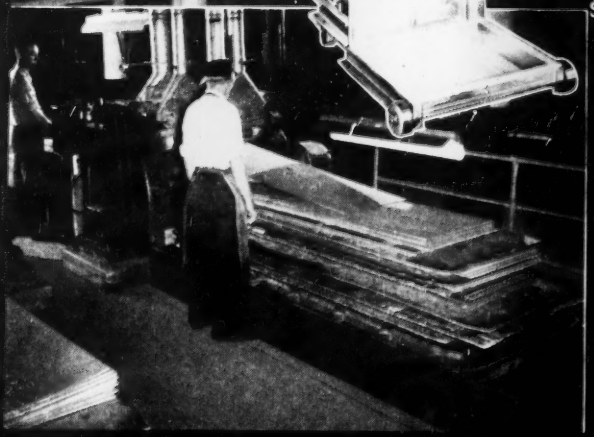

● **In hundreds of spots** throughout your operation you are required to lift or lower, take or fetch. Tools and dies must move from storage to machine—from machine to storage. Materials must be positioned. Machines must be fed.

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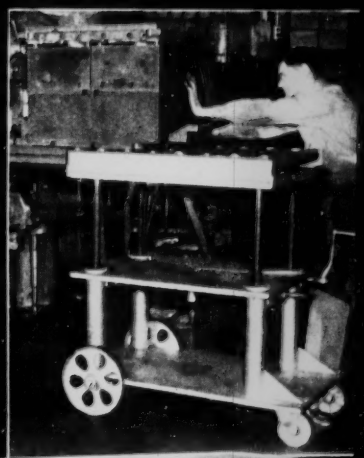

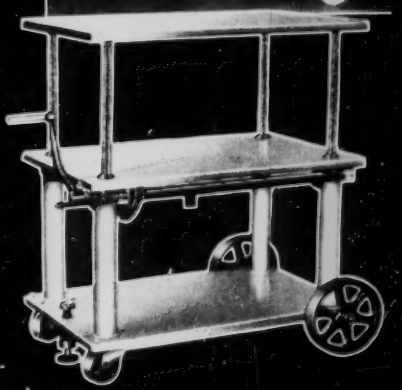

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SHORTAGES of important metallurgical additives have now been either directly relieved or compensated by satisfactory alternatives.

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TUNGSTEN: Restrictions are now eliminated on Tungsten, too. New production and resulting growth of stock piles have brought relief. Tungsten is readily available.

BORON: The potency of Boron as an intensifier of the effects of other alloying materials, is now well recognized. Very minute additions can be substituted for considerable percentages of scarcer and more costly elements, with full maintenance of the hardenability and other essential properties of high-grade steels.

The problem of an economical and satisfactory form in which to introduce Boron is met by Ferro Boron produced by the Molybdenum Corporation.

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For example, in stainless steel, excellent results have been demonstrated in hot workability and increased shipping yield. In nodular iron, small additions of rare earths have helped to produce consistently good ductility by counteracting tramp elements such as lead and titanium.

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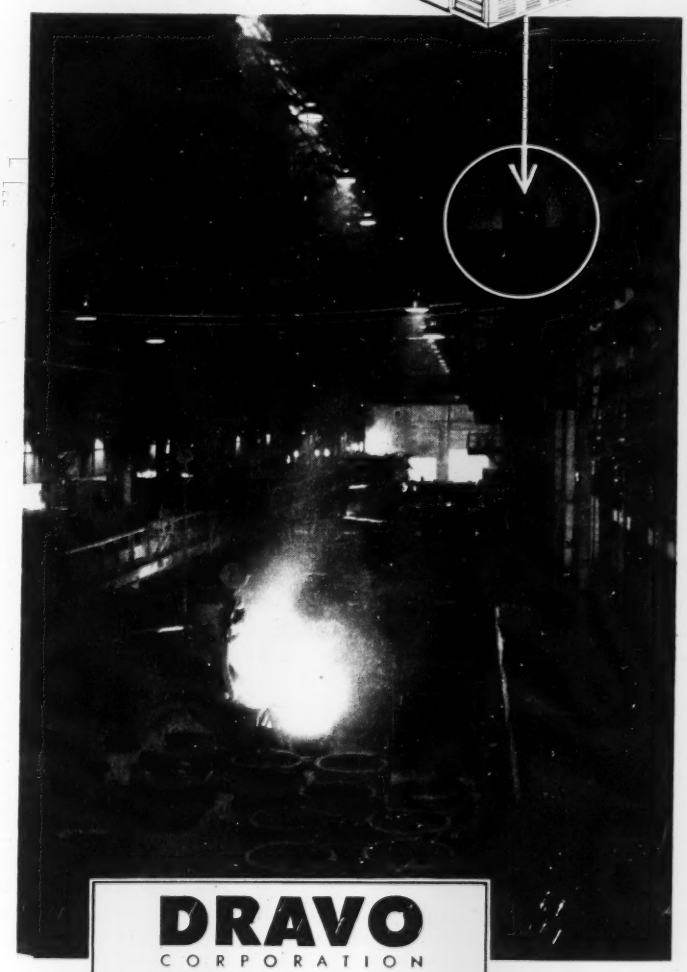
DRAVO CONDITIONERS SAFEGUARD HEALTH, ASSURE HIGHER PERFORMANCE AT THIS LARGE MIDWESTERN METALLURGICAL COMPANY...



To safeguard the health of crane operators and increase their alertness, and efficiency, a large midwestern metallurgical company installed Dravo Crane Cab Conditioners in the crane cabs operating over 6 submerged arc smelting furnaces. Dravo Crane Cab Conditioners provide constant year-'round ventilation, filter the air, and remove harmful dirt, dust and fumes. Crane operators' working conditions are greatly improved resulting in higher performance and increased efficiency.

No matter what radical temperature variations or atmospheric conditions occur in your industry, there's a Dravo Crane Cab Conditioner designed for your specific needs.

HERE ARE THE *Plus* ADVANTAGES DRAVO CRANE CAB CONDITIONERS AND COOLERS OFFER YOU~

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All self-contained and split-type Dravo Crane Cab Coolers are equipped with a forced-ventilation system, insuring a supply of cool air free from dust and fumes to the compressor motor.

2. RUGGED CONSTRUCTION
Dravo Crane Cab Coolers and Conditioners are supported by a structural steel frame of all-welded construction.

3. MAXIMUM VOLUME OF AIR
All units are equipped with centrifugal-type squirrel-cage fans which furnish maximum amount of air.

4. HIGH EFFICIENCY
Condenser discharge air exhausts directly into atmosphere, permitting lower operating temperatures within condenser section.

5. CONTROL PROTECTION
Heavy-duty industrial controls are enclosed in a forced-ventilation cabinet, free from dust and fumes.

6. COMPLETE LINE OF EQUIPMENT
Only Dravo has a complete line of crane cab coolers and conditioners. Interchangeable parts reduce inventory costs.

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GENERAL AMERICAN, with principal offices in Chicago, owns and operates the nation's largest private fleet of freight cars which are leased to many of the foremost industrial companies, and to railroads. In addition, it is a major builder of all types of freight cars, owns and operates tank storage facilities, and is engaged in the manufacture of process equipment and molded plastics.

In pursuance of a program of diversification, General American has acquired the business and assets of the Parker-Kalon Corporation through the purchase of capital stock. The business will henceforth be operated as the Parker-Kalon Division of General American Transportation Corporation.

The present management of Parker-Kalon will continue in charge. The sales and service policies which have won the approval of the many thousands of P-K customers will remain in effect. As always, P-K Fasteners will be sold through P-K Distributors in every industrial area in the United States, Canada and in many foreign countries.

With the far greater resources available through its new ownership, Parker-Kalon will accelerate a program of improvement and expansion. New production and warehouse facilities will be built to meet the constantly increasing demands for P-K fasteners. Engineering and research will be augmented to speed the perfection of new P-K products now in development.

Now, even more than before, you can rely on Parker-Kalon for leadership in fastener design, for consistently high fastener quality, and service in step with your needs.

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STEEL
November 23, 1953

Metalworking Outlook

An Era of No Depressions?

Except in a few minor cases, business in the nation requires no help from the government now, President Eisenhower believes. But his administration will take whatever steps necessary to bolster the economy when and if needed, he says. It may all be just a foolish dream, but more and more economists in and out of government are saying that a depression like that of the 1930s is no longer possible because of the weapons available to the U. S. to prevent such a disaster.

A Little Too Late

Where the government is extending economic help now, business men are not expecting much real benefit from the assistance. Some 39 U. S. areas currently classified as having more than 6 per cent of their labor force unemployed can now get full five-year tax amortization for new or expanded facilities and are eligible for special consideration in the awarding of defense contracts. Industrialists in the areas say the move comes too late. Most of the hard-hit cities—such as Lowell and Lawrence, Mass., Wilkes-Barre, Altoona and Scranton, Pa., Newport, Tenn., Big Stone Gap-Appalachia, Va.—are coal or textile towns.

Steelworkers Quiz the Companies

Some steel producers are balking at answering a 17-page questionnaire on pension and insurance plans sent by the United Steelworkers of America-CIO to many of the companies with which it has contracts. Detailed information is requested for 1950-1952 on provisions of the company's plans, cost to the employer and the amount of benefits which has been paid out to employees. Steelworker President David McDonald says USA requests the information "to formulate constructive proposals for intelligent bargaining." It's the first industry-wide survey of such scope undertaken by a labor organization.

More GAW Talk Coming

Watch for more drum-beating about the guaranteed annual wage when the United Auto Workers-CIO holds its National Full Employment Conference Dec. 6-7 in Washington. The issue was, of course, brought up at the CIO's Cleveland convention (see p. 44), but more concentrated attention will be given the matter in Washington.

Leasing: Still Snarled

The knotty problem of what to do about excess government-owned defense equipment remains snarled. Defense Mobilizer Arthur Flemming issued a policy statement about it in September, but Defense department and other officials who have to implement the policy say that it's utterly inadequate. A new application to lease government equipment for civilian uses is now before the Office of Defense Mobilization. Watch what ODM does about it;

The Technical Outlook—p. 83 The Market Outlook—p. 127

Metalworking Outlook

the agency's solution, if any, may help in cutting what is turning into a Gordian Knot. A newly activated ODM unit, Defense Facilities Maintenance Board, will deal with the leasing program.

Expansion in Electricals

General Electric Co.'s expenditures for new plant and equipment since 1946 will reach about $818 million by the end of this year. The entire electrical machinery and equipment industry will have spent $2.5 billion on capital improvements and expansion from 1946 to the end of 1953.

Industry Keeps Quiet

Industry has done a lot of complaining about antitrust laws, but few businessmen responded to the invitation of the Attorney General's Committee to Study the Antitrust Laws for views on how those statutes should be revised. So, changes to be recommended will originate almost exclusively in the committee which sights the "latter part of 1954" as target date for completing its studies.

The Congressional Issues

As President Eisenhower sees it, the major legislative matters that will come up before the next Congress will be government expenditures and the balanced budget, tax policy, Taft-Hartley labor amendments, public housing policy, social security expansion, foreign aid and trade and the farm program. Majority leaders, including committee chairmen, will be briefed on the President's views at a White House conference Dec. 17-19.

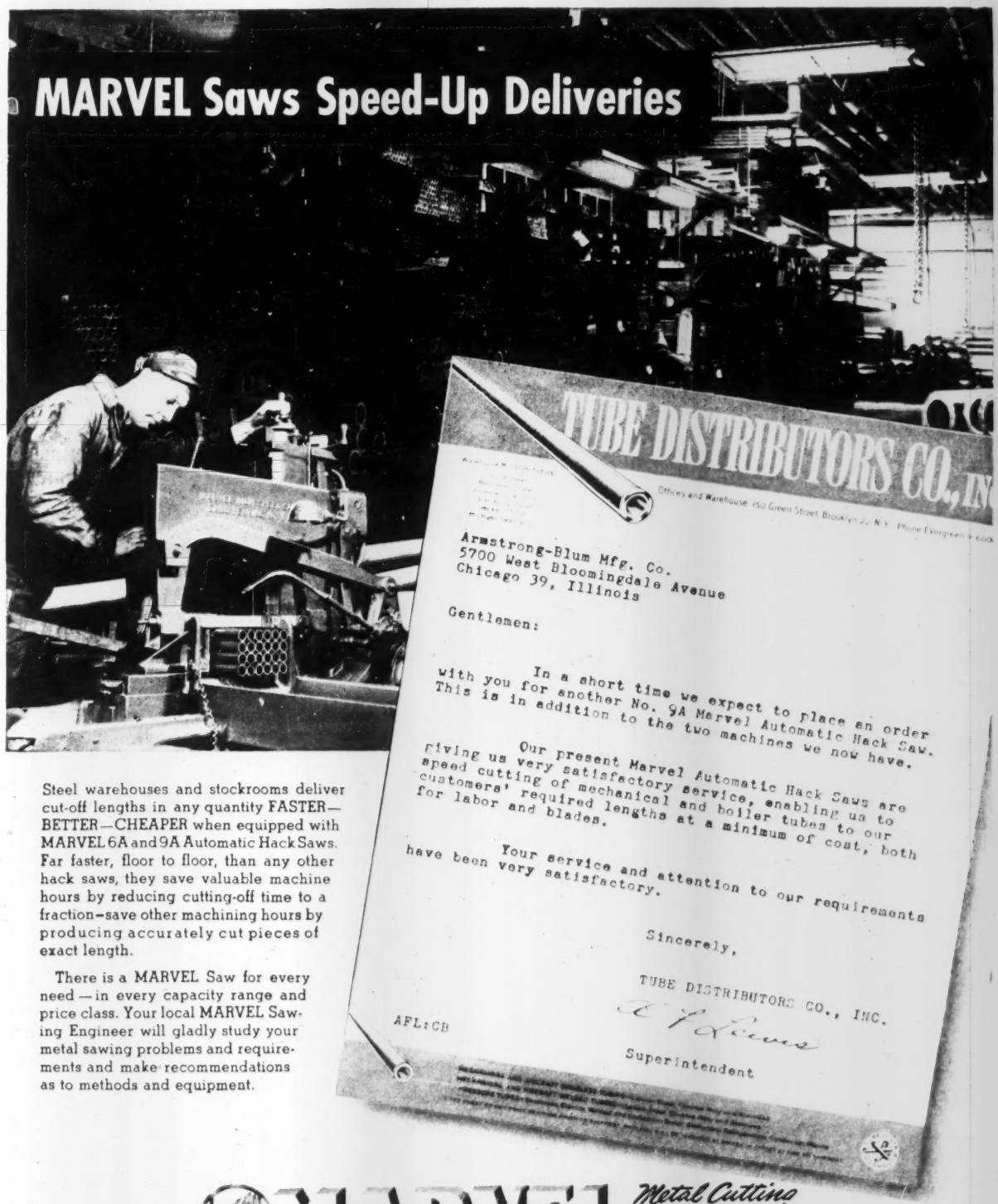
Straws in the Wind

Chrysler Corp. will start making its own power steering for Chrysler and DeSoto cars about the end of this year when it will drop Gemmer Mfg. Co. as a supplier of the unit . . . Inventories of new cars rose to a postwar high of 13.5 per dealer as of Nov. 1 . . . Ford Motor Co.'s surplus on the balance sheet for Dec. 31, 1952, of $811 million is $88 million more than at the end of 1951 and suggests that Ford had substantial profits last year, perhaps second only to 1950 when it earned an estimated $279 million . . . Industry is protesting that the Department of Defense's new $10.5-million aircraft tubing plant at Wallingford, N. J., should be built by private capital.

This Week in Metalworking

Gross national product may hit nearly $350 billion in 1954, off less than 5 per cent from the $367.5 billion expected for 1953 (p. 43) . . . U. S. Steel Corp. Chairman Benjamin Fairless and Steelworker President McDonald begin their industrial relations tours (p. 45) . . . National Metal Trades Association recommends three avenues by which industrial relations may be improved (p. 46) . . . The electronics industry is booming in New England as its employment jumps 53 per cent since 1951 (p. 46) . . . Metalworking's mobile salesrooms are moving more goods (p. 55).

MARVEL Saws Speed-Up Deliveries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Your service and attention to our requirements have been very satisfactory.
Sincerely,
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Superintendent

Steel warehouses and stockrooms deliver cut-off lengths in any quantity FASTER—BETTER—CHEAPER when equipped with MARVEL 6A and 9A Automatic Hack Saws. Far faster, floor to floor, than any other hack saws, they save valuable machine hours by reducing cutting-off time to a fraction—save other machining hours by producing accurately cut pieces of exact length.

There is a MARVEL Saw for every need — in every capacity range and price class. Your local MARVEL Sawing Engineer will gladly study your metal sawing problems and requirements and make recommendations as to methods and equipment.

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Yes Sir, Mr. Purchasing Agent

WELCOME to the Driver's Seat!

Believe it or not, warehouse people did not find the recent steel shortage any more of a joy ride than did steel users themselves.

We, too, had our troubles buying steel. And trying to "divvy" up what we could get in a way to pacify, let alone satisfy insistent customers was enough to challenge the wisdom of Solomon!

So we're glad to kiss good-by the so-called sellers' market and all its gimmicks. It'll be lots more fun working to pluck orders than to duck them. That's how all reputable warehouses feel.

So, whenever you need steel and your mill sources can't give you as much or as little as you want, as quickly as you want it—chances are good that your warehouse supplier can.

When it's Job-Fitted sheet or strip you need, we hope you will call Reliance. We'll do our best always to take care of it for you.

DEPENDABLE DAN will take care of it for you!

And here's Dependable Dan with a word about the Reliance JOB-FITTING Idea—

. . . It's knowing our "stuff" . . . our "feel for steel."

. . . It's knowing your job . . . what you expect the steel to do for you.

. . . It's supplying in-stock sheet and strip best suited to your immediate need.

FOR HELPFUL ACTION CALL OUR NEAREST PLANT OR OFFICE

RELIANCE STEEL DIVISION

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Basically Partners

Last week David J. McDonald, president of the United Steelworkers CIO, took time out from the annual meeting of CIO to join Benjamin F. Fairless, chairman of U. S. Steel Corp., in a tour of five corporation plants in Lorain and Cleveland. This week they will visit plants in Pittsburgh and later will tour those in other areas.

These visits are an experiment in industrial relations. Apparently nobody expects any miracles. Mr. Fairless says simply: "Basically, we're partners. The way to get along together is to get to know each other better, to get the feel of things at the plant level, to meet the men on their jobs. We will do a lot of listening."

Mr. McDonald's approach is even more specific. "Let's put it this way," he says. "Ben has a lot of stockholders who are members of our union. We have a lot of members who are stockholders. I am a U. S. Steel stockholder. We have a common interest in seeing that our industrial relations system works and works better than it has. We are not going to abandon our fighting organization, and when it is necessary we will fight. But we are seeking to improve our day-to-day operation."

These statements are interesting in that they both place heavy emphasis upon the mutual interests of employers and employees. Every thinking person knows that this mutual interest exists and that it is much more important than is generally realized. The great pity is that there is so much effort being made — sometimes deliberately and sometimes unwittingly — to promote antagonism between employer and employee and to play down or deny the common interest.

For example, the 115-page report by CIO President Walter P. Reuther to the Cleveland convention last Monday contained attacks against business which not only are unwarranted but they also indicate that Mr. Reuther advocates policies that are as injurious to CIO members as to employers. His condemnation of accelerated depreciation is condemnation of something that would benefit every CIO member.

It is to be hoped that the idea of mutual interest emphasized by Messrs. Fairless and McDonald will take root in high places.

E. L. Shaner

EDITOR-IN-CHIEF

1954 OUTLOOK BETTER: A spot check among representative executives in the metalworking industry indicates clearly (p. 43) that the intangible which we call business sentiment has improved appreciably during the last six weeks. A month and a half ago the concensus was that business volume in 1954 would be 10 to 15 per cent below that of 1953. On

the basis of current opinion, the expected decline will be only 4 or 5 per cent.

Translated into terms of gross national product, the latest poll would mean a total of $349.9 billion for 1954. This would be less than 5 per cent under the gross national product of $367.5 billion expected in 1953, and it would be the second highest in history. Strangely enough, another authority, after querying 138 leading economists, comes up with a prediction of a GNP of $359.2 billion for 1954, which is much more optimistic than the picture our crystal-gazing metalworking executives envision.

PROGRESS IN LIGHTING: For as long as most persons in managerial positions can remember, lighting of industrial plants has been a problem that is never quite solved. From the days near the turn of the century when electric lights in some areas replaced more primitive forms of lighting, there have been few periods, if any, when the problem of industrial lighting could have been described as static.

Right now the Illuminating Engineers Society has revised its standards for lighting in metalworking establishments. You can check the recommended number of footcandles (p. 54) for almost every conceivable metalworking operation, and you can install new lighting equipment to provide the recommended illumination. But we'll bet that after revamping your lighting facilities to conform to the latest edicts of lighting engineers, they will come up with a major improvement in a year or two that will make your ultramodern installation of 1953 look hopelessly obsolete. Such is progress in illumination.

TAPS LABOR SURPLUS: Foster Wheeler Corp., well-known builder of heavy equipment for oil refineries, steam power plants and process industries, is erecting an unusual pressure vessel manufacturing plant in eastern Pennsylvania. Among its features (p. 48) will be a 2-million volt x-ray machine capable of photographing foot-thick steel in clear detail with short exposure time. The plant also will be equipped with special machinery for fabricating heavy steel plate.

Almost as interesting as this novel equipment is the site chosen for the $5-million pressure vessel plant. It is being erected at Mountaintop in the Wyoming valley of Pennsylvania. One reason for choosing this spot is the assurance of abundant manpower. Closing of anthracite coal mines in the vicinity of Scranton and Wilkes-Barre has made this a labor surplus area. Also, the site certainly conforms nicely to the general idea of a wider dispersal of industrial facilities.

RETAIN LOCAL CONTROL: From Washington come reports that various government agencies, such as Defense, Agriculture and Interior, are interested in a national water saving and purification program. It is stated that the thinking of the Eisenhower administration is that state and local initiative in this program (p. 50) should have precedence over federal action.

This is an important issue and it concerns metalworking establishments directly. Wherever your plant may be, it is interested in water tables, flood waters, erosion, etc., in your immediate vicinity. One way to attack this problem is to set up a local authority to deal with it. Another is to do nothing and by default invite federal government to assume jurisdiction.

More and more enlightened leaders in many communities are establishing local authorities to deal with these vital problems. Why don't you act to promote a local authority which will keep the federal government from infringing upon rights that basically belong to local interests?

PRIVATE OWNERS EAGER: A small item on the page of foreign news (p. 53) will be reassuring to many readers on both sides of the Atlantic. A dispatch from England states that during the first 12 days that stock was offered for sale in the United Steel Companies Ltd. the first large nationalized British steel property to be resold to private investors applications for about 40 million shares were received. This is a really impressive oversubscription, because only 14 million shares were for sale in this first offering.

This initial experience in seeking private buyers for the denationalized properties is encouraging. Perhaps it reflects a new confidence among many Britons that the more radical type of socialism has had its fling and that the nation is settling down to a keener appreciation of the solid virtues of a more conservative government.

So much to be thankful for . . .

We always look forward to Thanksgiving Day — a day of happiness and hope . . . a day set aside for expressing our heartfelt gratitude for the spiritual guidance and material strength which have preserved our liberty in the past — and will, we earnestly hope, safeguard our rights and happiness in the years to come.

✡

At this time we are particularly thankful for being privileged to live in a land where the individual can still enjoy our cherished freedoms — where it is still possible for everyone to choose his work, his way of life and worship. These freedoms are all part of our rich inheritance as Americans. Let us continue to treasure and protect them.

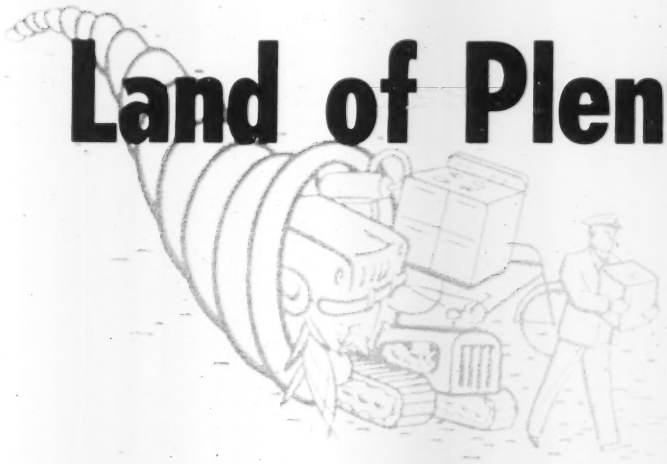
RYERSON STEEL

"Neither
snow
nor rain
nor heat
nor gloom
of night
stays these
couriers..."
when
an Inland
customer
needs help.

INLAND

INLAND STEEL COMPANY
38 South Dearborn Street • Chicago 3, Illinois
Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis
Kansas City • Indianapolis • Detroit • New York

Land of Plenty—1954



Industry is more optimistic than it was a mere six weeks ago about next year's business. The 1954 gross national product may slip only 5 per cent from the 1953 peak

GROSS NATIONAL PRODUCT
(Total output of goods and services)

	Billions
*1954	$349.9
1953	367.5
1952	348.0
1951	329.2
1950	284.2
1949	258.2
1948	259.0
1947	233.3
1946	211.1

*Estimated by STEEL. Source for other figures: Department of Commerce.

BUSINESS PSYCHOLOGY, the condiment in our economic diet that can make a hash or a feast of the best ingredients, has improved in the past six weeks.

A spot check by STEEL of 191 metalworking executives reveals that we'll still be feasting in 1954. The chart above shows that the total output of goods and services (gross national product) next year will hit an estimated $349.9 billion, the second highest in history and less than 5 per cent under the record $367.5 billion expected for 1953.

Matter of Time—A month and a half ago the consensus was that 1954's volume would be fairly good, but still 10 or 15 per cent below this year's levels. Now, business opinion places the expected decline at only 4 or 5 per cent. Of the 191 who responded to STEEL's check, 59 executives foresee no change, 52 expect an increase and 80 look for a decrease.

The weighted average of those replies puts next year's decline at 4.8 per cent. A surprisingly large 16.7 per cent of the respondents predict an increase of more than 10 per cent in 1954. A surprisingly small 21.9 per cent of the respondents predict a decrease of more than 10 per cent in 1954.

Comparison—Even so, the poll is more pessimistic than some others. F. W. Dodge Corp., for example, queried 138 leading economists. Calculations based on median values of 129 answers indicate GNP for 1953 will soar to $369.1 billion, then drop only about 3 per cent in 1954 to $359.2 billion.

Why the increased optimism? The major explanation is the continued high level of personal consumption expenditures, which is expected to continue into next year. For 1953, personal outlays promise to reach $231-$232 billion, an all-time high and 6 per cent above the $218.1 billion of 1952. Expenditures for hard goods may drop next year, but many economists look for tnat decline to be offset partly by increased spending for food and other nondurables.

Other Supports — Construction, too, is sky-high this year, with a peak $35 billion volume that will be only moderately better than the $32-billion or $33-billion level anticipated for next year. New plant and equipment expenditures in 1954 also will be high—$25 billion or more, compared with $27 billion in 1953. Continuing big defense outlays are still another reason for confidence in 1954. We're spending now about $1 billion a week for the military; as plans currently go that will rise slightly next year, then drop in 1955.

As one industrialist puts it: "This all adds up to the fact that we'll be living high on the hog for at least another year."

GM Announces Largest Issue

General Motors Corp., Detroit, announces issuance of $300 million worth of 25-year debentures, the largest public offering of an industrial issue in the United States. Public issue is expected to begin about Dec. 9 by a nationwide group of investment firms headed by Morgan Stanley & Co.

GM, which at present has no funded debt outstanding, expects to use proceeds from the sale in part for financing its huge program of capital expenditures and

in part for working capital. In the four years from Dec. 31, 1949, to Dec. 31, 1953, the corporation will have spent about $1250 million on capital equipment. Officials of the company explain that those expenditures are about $700 million in excess of depreciation charges for the same period. In addition, increased sales volume has made it necessary to raise more working capital.

Steelworkers' Hourly Rate Up

Wage, hour and employment figures for the iron and steel industry took an up-and-down pattern in September as average hourly wage per worker rose to new heights, total payroll declined, average hours per week per worker went up and total employment went down.

The average steelworker earned $2.328 an hour, or one cent an hour above his August wage, and worked 39.2 hours as compared with 38.2 in August. Steel companies paid a total of $283.8 million to 687,000 workers in September, both figures down from the August totals of $287.3 million and 695,000, respectively.

Average wage, total wage and total employment for September were all above the comparative figures for September, 1952, but average workweek was below the 40.3 hours of a year before.

In the first nine months of 1953, total wages exceeded earnings of workers for any full year prior to 1951.

Unemployment Problem Studied

Are present unemployment insurance benefits adequate to tide unemployed workers over temporary periods of idleness?

Answers to this question will be sought from a survey to be conducted jointly by the Labor department and state employment security agencies.

The Labor department is expected to urge Congress next year to adopt a council recommendation that the Federal Unemployment Tax law be amended to permit the states to assign reduced tax rates to new or newly covered employers after one year of experience instead of after three years as at present.

Labor Revises Its Battle Tactics:

At its Cleveland convention, the CIO sounds off politically as it attacks the Eisenhower administration on practically all domestic issues and many foreign policies

WATCH for increasing political activity by the Congress of Industrial Organizations in opposition to the Eisenhower administration.

The CIO doesn't like what the administration is doing on the domestic front. The union likes only part of the foreign program.

The CIO holds the Republican Congress and administration are following a domestic course "which will wipe out the gains made by the workers, farmers and consumers during 20 years of Democratic administration."

More Political Action—An expansion in its program of political action is the union's antidote for Republicans. Such an expansion is authorized in a resolution adopted by the CIO's 15th constitutional convention in Cleveland, Nov. 16-20. It outlines a drive for union dollars for political use, for the integration of CIO political activities with those of other labor organizations, farmers, minority groups and almost any group that shares the CIO animosity toward the present administration.

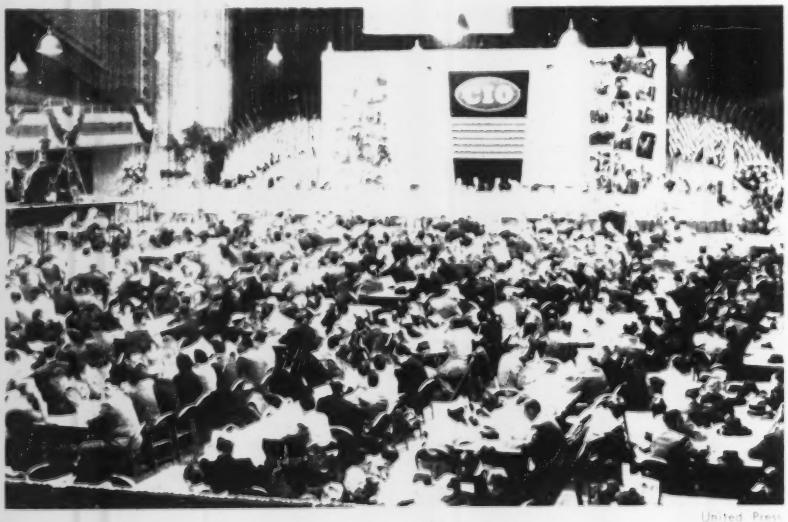
Critical—Keynote for the criticism of the Eisenhower administration was sounded by CIO President Walter Reuther. "Organized labor has seen little to encourage full acceptance of President Eisenhower's oft-repeated statement that his is a 'middle of the road' administration."

A message by President Eisenhower to the convention promising changes in the Taft-Hartley Act would be proposed to Congress next January was greeted by the convention with a stony silence.

In fact, all representatives of the present administration, including Secretary of State John Foster Dulles and Secretary of Labor James D. Mitchell, both featured speakers, were given a cool reception.

No Side Door—Secretary Mitchell warned the CIO that labor problems no longer would be "carried into the White House by the back stairs, as was the case too often in the past."

He promised that labor problems would get open, sympathetic consideration. Among the problems to receive early consideration are raising the minimum wage standards, extending coverage of the minimum wage law and amending the Taft-Hartley Act. He



United Press

CIO IN CONVENTION
. . . new methods to reach old goals

More Politics, Modified Approach to Management

asked the union to quit talking about repealing the act and cooperate in eliminating undesirable features in the present law.

A CIO resolution, however, reaffirms the union's goal of seeking Taft-Hartley repeal.

Nonaggression Pact—The convention approved, as expected, a no-raiding agreement between the CIO and the AFL. Another resolution deplored raids on CIO unions by the Teamsters Union.

Delegates directed its Unity Committee to continue negotiations with the AFL but cautioned against "sacrifice of any of the basic principles for which the CIO stands."

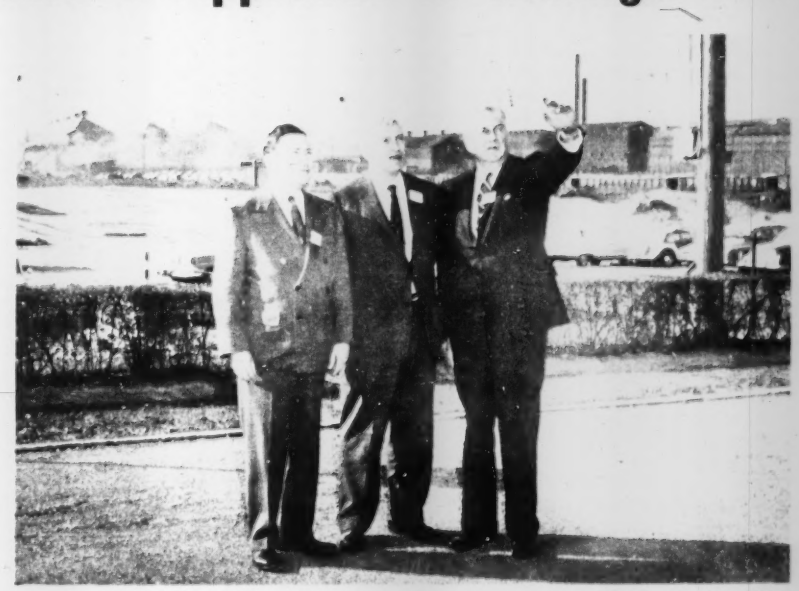
GAW "Close at Hand" — The time for achieving the guaranteed annual wage, President Reuther told the delegates, "is close at hand." The convention then went on record as supporting the efforts of the member unions in negotiating guaranteed wage contracts.

Noting that conditions vary greatly in the industries represented by the CIO unions, the parent union will leave the negotiating of annual wage plans to the affiliated unions. A Guaranteed Annual Wage Committee of the CIO will provide for exchange of information among the affiliated unions and will seek to explain the CIO's views to the public.

Labor Battle Shapes Up

Labor leaders in Washington are not impressed with President Eisenhower's assurance to the CIO convention at Cleveland that he would submit his Taft-Hartley amendment program to Congress in January.

So they are preparing to launch a rough and tumble attack in the 1954 session to get from Congress what they want. To achieve such a goal, they will have to knock out the support particularly among legislators from the South and the agricultural sections — that is gathering behind the Lucas and Goldwater bills (H.R. 3055 and S. 1161), which would give the states complete authority to regulate strikes and picketing.



United Press

AS&W's W. F. Munford briefs Fairless and McDonald as . . .

Ben and Dave Start Their Industrial Relations Tour

IT IS BEN AND DAVE as the chairman of U. S. Steel Corp. and the president of the United Steelworkers-CIO join hands to tour the corporation's plants. They are trying to find out what makes labor-management relations tick, or fail to tick, at the plant level.

U. S. Steel's Benjamin F. Fairless and David J. McDonald, steelworkers' chieftain, this week will visit corporation plants in the Pittsburgh district. Last week they visited the National Tube Division at Lorain, O., and four American Steel & Wire plants at Cleveland. Later they will go to Chicago and then on to the western facilities of U. S. Steel.

At Cleveland, they talked to local management, to local union heads and grievance committeemen and to workers. The tour was climaxed by a "love feast" attended by about 250 representatives of local management and local unions.

Strike Outgrowth — The joint tour plan grew out of the bitterness developed during the 1952 steel strike. Mr. Fairless, concerned over the strife, proposed to Philip Murray, then head of the steelworkers, that such a tour be made. Mr. Murray agreed with alacrity. A few months later Mr. Murray died, necessitating a delay in putting the plan into effect.

During the Cleveland tour, Messrs. Fairless and McDonald were greeted enthusiastically by the workers in the five plants visited. For several days the workers had been busy cleaning up their facilities for the visit.

No Miracles — The tours are frankly an experiment.

Mr. Fairless puts the objective this way: "Basically, we're partners. The way to get along together is to get to know each other better, to get the feel of things at the plant level, to meet the men on their jobs. We will do a lot of listening."

Mr. McDonald says: "Let's put it this way. Ben has a lot of stockholders who are members of our union. We have a lot of members who are stockholders. I am a U. S. Steel stockholder. We have a common interest in seeing that our industrial relations system works and works better than it has.

"We are not going to abandon our fighting organization, and when it is necessary we will fight. But we are seeking to improve our day-to-day operation."

Leads for Management

Improve your industrial relations. NMTA outlines three avenues to follow

YOU, as management, can enlarge your lead in industrial relations through these three avenues: Effective collective bargaining, improved communications and efficient supervision and wage administration.

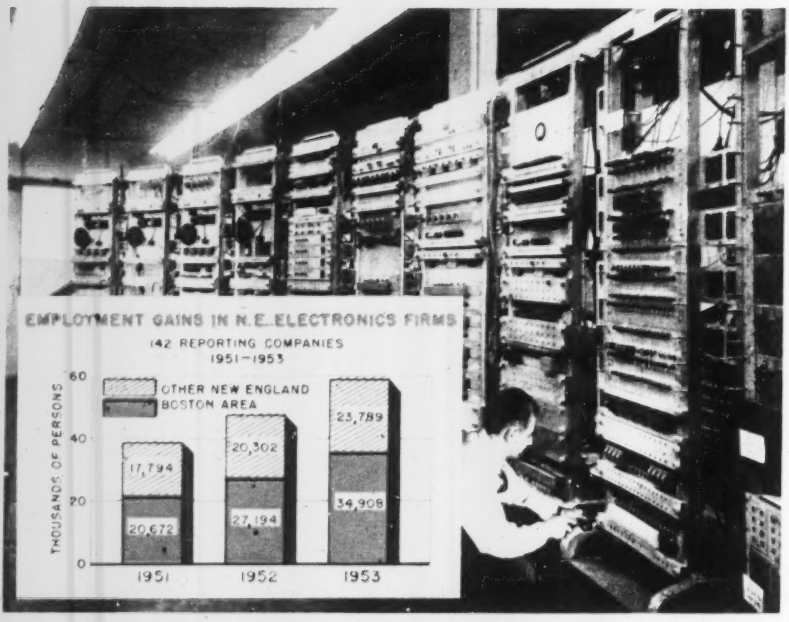
The efficacy of these avenues was explored at the National Metal Trades Association convention in Cleveland last week. An estimated 800 U. S. industrialists registered for the two-day sessions.

Firm Stand—In your collective bargaining, urged H. P. Steele, vice president, Benjamin Electric Mfg. Co., Des Plaines, Ill., adhere to certain sound principles. You should not grant minor concessions just because it's an easy way out many of these are pointing more and more toward union's co-determination in management's functions. And too, you should recognize the difference between union-company relations and employee-company relations.

Effective communications as propounded by M. O. Cross Jr., president, Cross Co., Detroit, should be properly timed and positive in their approach, and the truth should stand out so strong as to appear self-evident. Communications should be made in the employees'-language and should contain answers in advance to any possible questions which could arise.

Fair Pay—The third avenue discussed by F. K. Becker, president, Bird Machine Co., South Walpole, Mass., related to training foremen to be better supervisors. Frequent shop meetings and training courses are recommended. Proper wage administration, he stated, necessitates fair pay for the employee through job evaluation and a system of merit rating in plant-wide wage levels.

Earle S. Day, vice president, Collyer Insulated Wire Co., Pawtucket, R. I., was elected president, and O. D. Reich, retired vice president, Dexter Folder Co., Pearl River, N. Y., received the association's annual award for "achievement in industrial relations."



Source: Federal Reserve Bank of Boston. Raytheon

Electronics: New England's Rising Potential

Employment in the industry has jumped 53 per cent in two years. Research facilities, labor supply, expansion plans of firms point to continued growth

ELECTRONICS, a young industry flexing more and more muscle in the industrial world, may be providing New England the adrenalin needed to replace lost industry.

The rapid employment growth (see above) of the electronics industry is overshadowing much of the concern over New England's loss of industry, particularly the textile mills. A survey of electronics by the Federal Reserve Bank of Boston shows that it "is growing so rapidly that it will not stand still long enough to be measured."

Know-how Near—Spurring this development to a great degree is the proximity of research facilities. This is especially true of the Greater Boston area where half of the electronics manufacturers of New England are located. Here are found what many believe to be the greatest collection of scientific ingenuity to be had in so small an area topnotch laboratories, engineering groups and the educational institutions of Harvard, Boston University and Massachusetts Institute of Technology.

Definition of "electronics" by government bureaus has been impossible, and the Bureau of Labor Statistics lists most of the lines under "electrical machinery." Figures here show that this has been New England's fastest growing activity. Since 1939 the industry has provided 80,000 new manufacturing jobs, a fifth of the total for the region.

Half Are "War Babies" — Over half of the electronic firms reporting in the survey started operations during World War II, about 10 per cent after the war and the remainder before the war. Employment data from 142 firms reporting in the survey show that employment advanced 53 per cent from January, 1951, to January, 1953 (see above).

What's caused this growth? Respondents' answers to advantages they find in New England give an indication: The research facilities already mentioned, availability of skilled labor, accessibility of materials, nearness to markets and nearness to the "center of electronics business" in Boston.

The Other Side—But the industry was also quick to list New Eng-

land's disadvantages which provide challenges to Chambers of Commerce, politicians and those interested in civic and industrial improvement of the area: High costs of labor, lack of financial sources, high state and local taxes and high transportation costs were the most frequently mentioned.

Nearly two-thirds of the manufacturers stated that they planned future expansion in New England. Only 77 gave quantitative estimates of the expansion plans; the totals added up too an estimated $23-million investment, plant expansion of over 2 million square feet and about 7800 new manufacturing jobs.

A Guide—Defense expenditures have given most of the momentum to New England's electronics industry progress; defense cutbacks pose the problem of continuing the development in civilian markets. The survey asked manufacturers for suggestions to encourage continued growth and got these responses which may serve as a guide for New England's industrial planners:

1. Form a trade association or engage in some type of co-operative educational and promotional campaign to promote civilian markets. 2. Divert defense research expenditures to civilian product research. 3. Form an industrial center for electronics firms. 4. Request federal, state and local governments to take various actions to aid industry such as reducing taxes, providing vocational schools, land zoning and other industrial development incentives.

Attendance Sets Record

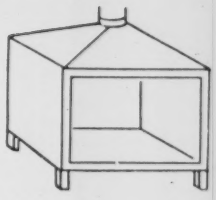
Attendance at the Wire Association annual meeting in Chicago, Nov. 9-12, reached 454 and set a new record for the association. Next year's meeting will be held at Hotel Statler, Detroit, Nov. 8-11.

District meetings also scheduled for next year include: Ferrous and nonferrous divisions at Worcester, Mass., Apr. 13-14; Pacific Coast group at the Biltmore hotel, Los Angeles, in June; nonferrous division at Providence, R. I., in September.

L. C. Crewe Jr., president, Maryland Fine & Specialty Wire Co., Cockeysville, Md., was elected president of the association.

Versatile Porcelain Enamel—

Displays admirable qualities for use in radiochemical fume hoods and laboratory furniture



A NEW AND EXACTING use has been found for versatile porcelain enamel.

That is the construction of radiochemical laboratory furniture. G. W. Parker, chief chemist, Oak Ridge National Laboratory, Oak Ridge, Tenn., reported porcelain enamel, in contamination susceptibility and ease of decontamination, was surpassed only by plate glass; it was decidedly superior to the more rugged materials such as stainless steel and plastics.

More Promise—"In addition to its extra chemical resistance," said Mr. Parker, "porcelain enamel shows every indication of being a more desirable material for radiochemical fume hood superstructures than the materials of construction now available for this purpose." As a material for the construction of laboratory working surfaces, he added, further investigation is needed to bear out the present promises.

Mr. Parker's report was a highlight of the Conference on Porcelain Enamel in the Building Industry, sponsored jointly by the Porcelain Enamel Institute and the Building Research Advisory Board, held at the National Academy of Sciences in Washington, Nov. 12 and 13. Papers read by 19 authors revealed that porcelain enamel, already a major coating in the building industry, is gaining rapidly

Helps Not Hinders—Forrest R. Nagley, Bureau of Ships, Navy Department, said that, while certain other notch-sensitive metallic coatings cause premature brittle failure of the basis metal, none of the porcelain enamel coatings tested in the past five years had any damaging effect; rather, these coatings were beneficial. "Porcelain enamel coatings," said Mr. Nagley, "on steel and 61S aluminum alloy can be so formulated and applied as to be elastic within and slightly beyond the elastic limit, in outer fibre straining, of the basis metal to which they are applied. There are indications that for special end uses the enamel can be selected on the basis of its relative thermal coefficient of expansion so that the coating is under residual compressive stresses and can effectively withstand plastic deformation in tension. This plastic deformation was observed in porcelain enamel on bend-test specimens of 61S aluminum alloy rolled plate ¼-inch thick." The tests also showed desirable vibration damping, permanence of appearance characteristics, corrosion protection to basis metal, and flame-barrier attributes.

Reporting on seven years' weather exposure of porcelain enamel samples, Dwight G. Moore, National Bureau of Standards, said "most enamels are highly resistant to deterioration under conditions existing at the selected locations; and those that are not resistant can be rejected prior to installation by simple laboratory tests."

Here and there—Higher initial costs of industrial building exteriors constructed of porcelain enameled sheet steel are recovered in six to nine years through reduced maintenance cost, reported Milton Male and Carl F. Block, United States Steel Corp. Dr. A. I. Andrews, University of Illinois, described the rapidly growing applications of porcelain enameled or ceramic coated metal to uses, such as superchargers and exhausts in airplanes and ships, involving high temperatures; porcelain enamel and ceramic coatings, he said, are being used to lengthen the service life of stainless steels as well as cheaper alloys and metals in such applications.

Giant Makes Debut

Two-million volt x-ray, said to be first in industry, ready for Foster Wheeler Corp.

SUPER-VOLTAGE x-ray, capable of penetrating foot-thick steel, will make its industrial debut in a new $5-million pressure vessel plant of Foster Wheeler Corp. at Mountaintop, Pa.

Said to be the first application of 2-million volt x-ray in private industry, the machine will photograph weld metal for flaws in clear detail with short exposure time. X-ray output is approximately equivalent in intensity and quality to 1000 curies of cobalt-60, allowing routine radiography of thicknesses under 6 inches in less than a minute. Manufactured by High Voltage Engineering Corp., Cambridge, Mass., the Van De Graaff x-ray generator will be housed in a massive concrete structure with four-foot thick walls and a concrete entrance door weighing 108 tons.

Good Location — Producer of heavy equipment for oil refineries, steam power plants and process industries, Foster Wheeler has fabricating plants at Cartaret, N. J., Dansville, N. Y., St. Catherines, Ont., and Egham Surrey, England. One big reason for locating in Pennsylvania's Wyoming valley close to Wilkes Barre: Plentiful manpower. Closing of coal mines in the area has made it a labor surplus area (See Sept. 14, p. 66). When Foster Wheeler's new plant swings into full operation at the turn of the year employment will reach about 500.

King-size machinery for fabricating heavy steel plate is now being installed in the new 100,000-square-foot-plus plant. An 8000-ton Baldwin-Lima-Hamilton hydraulic beam press weighing over 1500 tons will bend hot steel plate 8 inches thick or lighter plate up to 40 feet long into half shells for welding into pressure vessels.

Welding with Speed — Custom-built automatic shielded twin arc welding machines weld the plate at speeds higher than single wire welders. The power-driven units travel on a 150-foot track and are raised or lowered to accommodate 12-foot-diameter vessels. Built by Cecil C. Peck Co. and Lincoln Electric Co., both of Cleveland, the submerged arc dc current welders incorporate automatic flux recovery.

Another unique setup is a series of mobile radial drills that are arranged to cut drilling time and permit maximum utilization of tools. A battery of high-speed radial drills with 19-inch columns and 8-foot arms mounted along a 230-foot section of raised track can be positioned anywhere along the ways. Drums or pressure vessels are positioned on both sides of the ways on power rolls, and up to six drills can be used on a single drum.

THE BIG EYE
to detect metal flaws

Italian Process for Barium

Barium Steel Corp. says contracts have been let with Innocenti, S. G., Milan, Italy, for specialized equipment for the corporation's new seamless tube mill.

The new mill, to be located at Barium's Phoenix Iron & Steel Co. plant at Phoenixville, Pa., will produce seamless tubing of gages, weights and lengths which are now only obtainable from foreign steel producers. Construction has already begun.

Dr. Albert Calmes of Milan, Italy, internationally famous pipe mill authority, has been placed in charge of the construction and engineering of the new heavy wall and mechanical seamless tubing mill which will use his process. The Calmes process allows closer operating tolerances which result in a superior product both in the uniformity of wall thickness and surface finish.

Kaiser Steel To Expand

With the announcement that Kaiser Steel Corp. has completed financial arrangements for an $8-million expansion at Fontana, Calif., West Coast steel users can expect an increase in the amount of plate, sheet and tin plate produced in that area.

Henry J. Kaiser, president of the company, announces the sale to insurance companies of a new series of 20-year, first-mortgage bonds by First Boston Corp., Boston. Production at the West Coast plant will be increased approximately 17 per cent, or 120,000 tons a year, by the expansion.

Kaiser officials explain that production of the nine open-hearth furnaces has exceeded rated capacity, making more ingots available for rolling.

Under the proposed expansion, capacity of the continuous electrolytic tinning line will increase 50 per cent; hot strip and plate capacity will go up by about 10,000 tons a month, more than half of which will be processed in the tin plate mill; a mechanized conveyor will be installed from the hot strip mill to the tin plate mill, and new annealing equipment will be installed in the latter.

ODM Issues 160 Certificates

Office of Defense Mobilization announces authorization of certificates of necessity for fast tax amortization for 160 new or expanded facilities amounting to almost $234 million from Oct. 22 through Nov. 4. The new listing brings the total of certificates to 18,394 worth $28.7 billion, with 60 per cent of that, or $17.3 billion, eligible for rapid depreciation.

Of the 39 certificates on the new list amounting to $1 million or more, 15 are for railway trans-

portation and 11 for petroleum industry. Republic Steel Corp.'s application for a certificate worth $2.2 million for a powdered iron plant at Toledo, O., was granted, 65 per cent allowed for fast write-off.

Fifty-five of the new facilities involve small business ventures worth about $25 million.

Small-Firm Defense Work Grows

Small business continues to take a bigger bite out of government contracts as Small Business Administration announces that for August, September and October of this year they received $10 million more in defense contracts than during a similar period in 1952.

During the three-month period, the joint determination program awarded 290 contracts worth about $27.6 million to small companies, compared with 75 contracts worth about $17.9 million in the same period last year. Since the program began in May, 1952, small firms have received 3429 contracts totaling about $394.4 million.

AS&W To Build New Rod Mill

American Steel & Wire Division of U. S. Steel Corp. announces it will build a new rod mill in the near future at its Cuyahoga Works in Cleveland at an estimated cost of $10 million to $20 million.

The rod mill for the new plant will be purchased from Morgan Construction Co., Worcester, Mass. The mill will have the latest electronic and automatic controls and will roll rods from 7/32 inch to 1½ inches to coiling reels at about 60 miles an hour, nearly twice the speed of the present equipment.

Construction of the plant will begin as soon as sheds from part of an old plant are torn down to make room.

Soil Pipe Production Slips

Production of cast iron soil pipe and fittings declined slightly in September as compared to August, according to figures from the Cast Iron Soil Pipe Institute. September production was 33,090 tons as compared to August's 34,920 for the 21 firms reporting to the institute.

No Jetliners Tomorrow

Curtiss - Wright president believes turbo - compound will hold its own in near future

COMMERCIAL JETLINERS are still not sound economics and must develop greater efficiency before they can be utilized. So says Roy T. Hurley, chairman and president, Curtiss-Wright Corp., who believes his company's turbo-compound to be the outstanding engine for airlines "in the immediate and near future."

"At least 10 and possibly 15 years of use are ahead for the turbo-compound," said Mr. Hurley as the company displayed its near-automated assembly line for producing the engines at Wood Ridge, N. J. Assembly operations are carried on in about one-third the area and at one-half the cost of the line it succeeded.

Preferred — Curtiss-Wright claims its turbo-compound is outselling the British De Haviland Comet today, with 22 of the world's airlines using it. About ten new additions have come in the last six months, as against nine for the Comet, say C-W officials. The company also produces jets, ram jets and rocket engines for the military, newest of which is the J-67.

Curtiss-Wright

TURBO COMPOUNDS
. . . haven't conceded defeat yet

In the turbo-compound, three small turbines turned by exhaust gases are geared into the crankshaft, giving 20 per cent more power and 16-18 per cent more efficiency from gas otherwise wasted, says Frank Weigand, director, rotating engines.

Speed vs. Comfort—Planes will fly below the sonic barrier for some time to come because the ride would be too rough and the planes too costly, says Mr. Hurley. "Use of larger airplanes at greater speeds will bring forth turboprop and straight jet uses, but cost per horsepower must be brought down. The company today is selling horsepower at fewer dollars than any other industry except some auto engines."

Mr. Hurley estimates backlog at $900 million to $1 billion, about the same as at the beginning of the year. Company is developing its commercial airline business as an offset against defense drop-off, though 700 of its 30,000 employees were laid off recently because of "adjustments and increased efficiency."

DMEA Limits Financial Aid

Defense Minerals Exploration Administration amended its Order 1 to restrict its financial aid for exploration for new mineral deposits to those minerals still in shortest supply for defense needs. It also reduced the maximum percentage of such aid from 90 per cent of cost of exploration to 75 per cent.

Government assistance is now available for the following:

Group A, for which government will contribute 50 per cent of costs: Chromium, copper and molybdenum.

Group B, for which government will contribute 75 per cent of costs: Asbestos (chrysotile only), beryl, cobalt, columbium, manganese, mica (muscovite block and film only), nickel, platinum, tantalum, tungsten and uranium.

Appointments in Washington

Carl F. Oechsle, formerly executive vice president Haynes & Co., a Springfield, Mass., department store, has been sworn in as deputy assistant secretary of commerce for domestic affairs.

Carl R. Schedler, a special assistant to the secretary of the navy for industrial relations, has been appointed associate director for the Federal Mediation & Conciliation Service.

By E. C. KREUTZBERG *Washington Editor*

Economy-Minded Republicans May Make Their Mark in Conservation, If not Finance

DISGRUNTLED government employees who have been bumped down a peg or two and former workers who have been bumped right out of a federal job are reportedly organizing "Bring Back the Mess" clubs. As the Eisenhower administration has found to its sorrow, it's tough to economize in government. It's tough to cut down the payroll. Even so, the projected governmental deficit of $9.9 billion for the year ending June 20, 1954, has been whittled to a probable $3.8 billion. But when the final history of this administration is written, the highest accolade may go for another kind of economy—the husbanding of our natural resources.

Committee at Work . . .

Several of those broad-gage committees for which the President has such a penchant are at work on the problem. Secretaries Douglas McKay, John Dulles and Sinclair Weeks and Defense Mobilizer Arthur Flemming are on one. Their medicine will include more intensive exploration at home and resuscitation of the domestic mining industries through subsidies; buying contracts; the broader use of fast amortization to encourage expansion; and increasing research programs to find acceptable substitutes for the minerals we do not produce in sufficient volume within our boundaries. Mr. Dulles' assignment is to enable larger imports of strategic and critical minerals by establishment of a better climate for investment of private American capital in foreign mineral developments where laws now discourage such investment. As an approach to the raw material problem from the defense angle, Mr. Flemming has established in the Office of Defense Mobilization an Interdepartmental Materials Advisory Committee.

Conference for Study . . .

Concern over our mineral resources also will motivate the Mid-Century Conference on Resources for the Future, to be held at the Shoreham hotel, Washington, Dec. 2-4. The program calls for sections on nonfuel minerals, water, energy resources, world resources and research—with as many as 21 subsections meeting at once.

Water Policy Coming . . .

As part of the conservation policy, a national water saving and purification policy is in the works. Departments of Defense, Agriculture and Interior, the major interested government bodies, will formulate something soon. Odds are that their proposals will put heavy emphasis on local option. The administration wants to avoid the necessity of federal laws on the subject, believing that this is an area where the states' rights should be maintained. The purpose of the federal policy declaration will be to spur those few

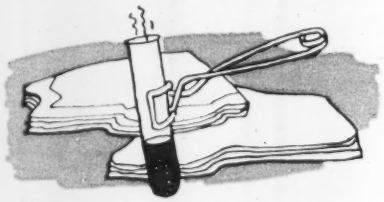
states that are still backward on the matter and to publicize the problem so that the general public will be aware of the situation.

Another Tack . . .

As another phase of conservation, the Air Force has asked Aircraft Industries Association to determine how much titanium scrap has accumulated at airframe plants during the two years they have been using the metal as a construction material. The Air Force sees this scrap as an additional source of titanium. The request is going out now because new vacuum furnaces specially designed for reclaiming titanium scrap without contamination will be placed in operation.

Two Birds, One Stone . . .

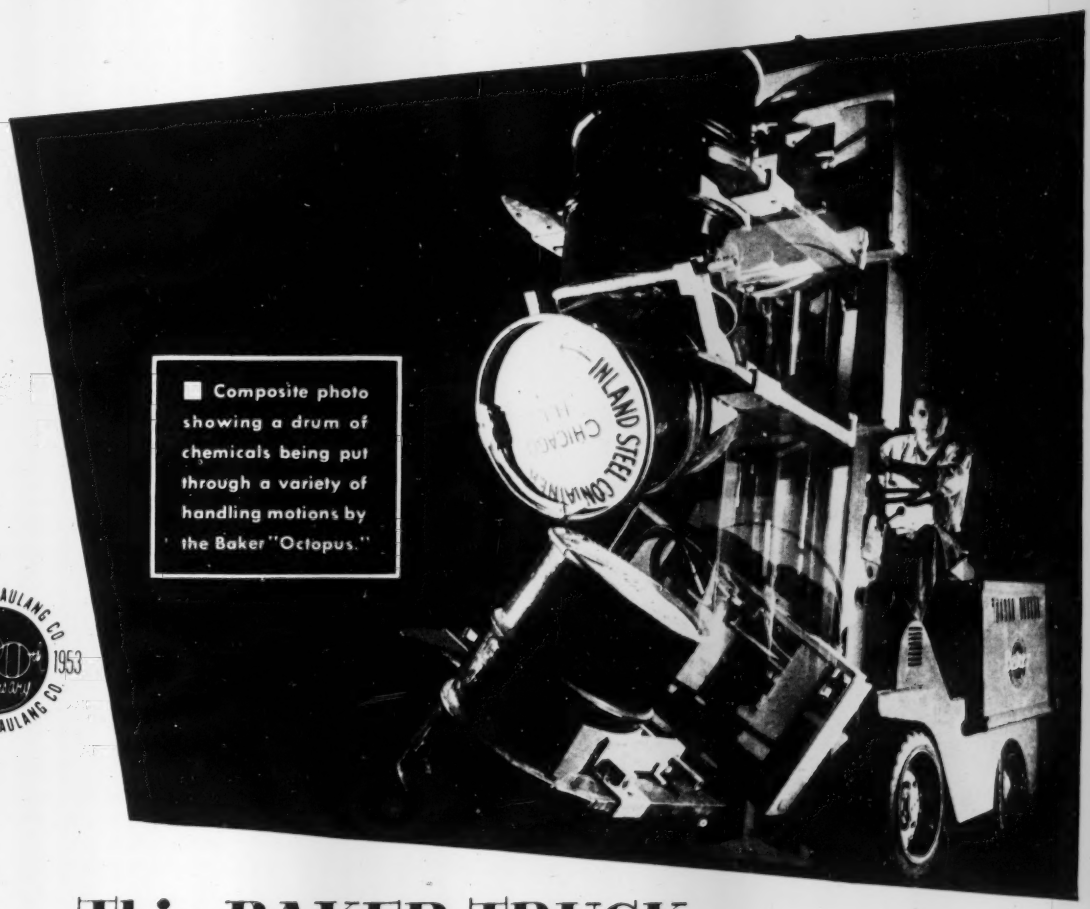
Because of its interest in financial economy and conservation, the government is particularly in-



trigued with a project that may further both aims. It wants privately owned companies to get interested in extracting a variety of aromatic and aliphatic chemical products from oil shale. Private companies would not cost the U. S. anything to support, would eventually pay taxes and would extract useful materials from what up to now has been a useless resource. Edgar Wormser, Interior's assistant secretary for mineral resources, has high hopes for such a private industry, pointing out that the Bureau of Mines has obtained a high yield of chemical products at favorable costs at its high-temperature retort in Laramie, Wyo.

Immediate Payoff . . .

Conservation is good, but Republicans realize that more vote-getting power lies in financial economy—hence, the unprecedented move whereby House Republicans plan to start Appropriation Committee hearings of budget requests for fiscal 1955 in advance of the President's budget message in January. The idea is to have several subcommittees, notably the Armed Services Subcommittee, start hearings as early as December to explore the opportunities for economizing.



■ Composite photo showing a drum of chemicals being put through a variety of handling motions by the Baker "Octopus."

THE BAKER RAULANG CO 1853 100th ANNIVERSARY 1953 THE BAKER-RAULANG CO.

This BAKER TRUCK handles any shape load...

and stacks it in any position!

■ You name the load—the Baker "Octopus" illustrated will handle it, whether it's a drum, a roll of newsprint, a packing case, a piece of machinery, a bale of cotton or a pallet load of cartons. Moreover, it will pick it up, transport it, raise or lower it, shift it to left or right, revolve it, up-end it, or stack it in any position. In fact, it will handle it with no more physical effort than is needed to operate the simple hydraulic controls.

The "Octopus" consists of a standard Baker Fork Truck equipped with a variety of Baker attachments—360° revolving head, 4-purpose carriage, up-ender, drum clamp, etc.—which may be applied individually or in combinations. While one truck may never be called on to perform all these functions, the "Octopus" demonstrates the range of utility of Baker fork trucks and attachments.

write for 6-page special report on the application of Baker attachments to various loads.

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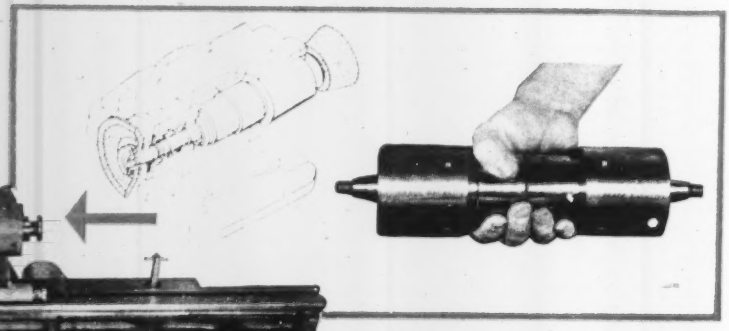
Material Handling and Construction Equipment.

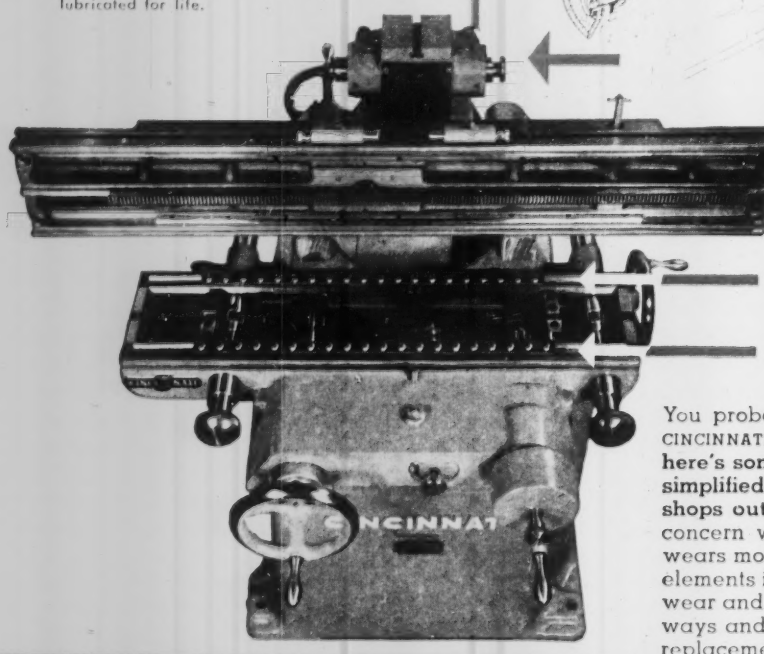
You're looking at Low-Cost maintenance of cutter and tool grinding equipment

A big Cincinnati advantage

Grinding wheel spindle cartridge, CINCINNATI No. 2 Cutter and Tool Grinder, **can be replaced in an interval of minutes.** Spindle is mounted on anti-friction bearings lubricated for life.

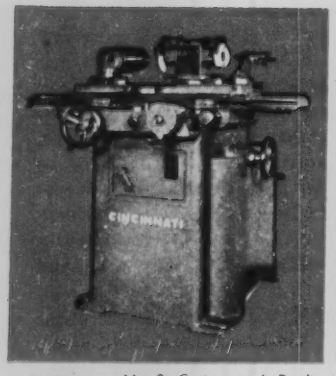


Sectional view of grinding wheel spindle cartridge.

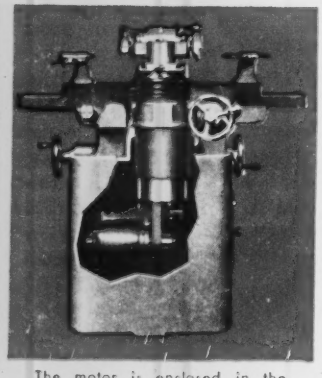


Anti-friction ways, CINCINNATI No. 2 Cutter and Tool Grinder, are hardened and ground, **easily replaceable.**

You probably know all about the versatility of CINCINNATI No. 2 Cutter and Tool Grinders. **But here's something you may not know about—the simplified maintenance features that help many shops out of a tight spot.** Two of these features concern wear. As you know, every mechanism wears more or less in use, but there are only two elements in CINCINNATI No. 2's that may eventually wear and affect performance—anti-friction slideways and wheelhead spindle. Should they need replacement after years of service, **the job can be done by your own men in about two hours' time.** Replacement ways are hardened, ground to "dummy" units in our shop; the wheelhead spindle is completely assembled in a cartridge unit. Anti-friction slideways; enclosed motor with plenty of room for maintenance; dual table controls at front and rear; wide selection of attachments for sharpening all types of cutters including sintered carbide . . . these and other features of low-cost cutter sharpening are fully illustrated in a 44-page catalog. You may obtain a copy by writing to our nearest direct office or agent, or the address below.



CINCINNATI No. 2 Cutter and Tool Grinder. For complete information write for catalog No. M-1734.



The motor is enclosed in the base, yet there is ample room for maintenance.

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MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Europe Has Itself To Blame, Not U.S.

A joint House-Senate Economic Committee says Europe should do more housekeeping, less leaning on U. S. aid. Other American business spokesmen echo the same theme

EUROPEANS have themselves to blame for lack of economic stability more than restrictive American tariffs or diminishing American economic aid.

That's the conclusion of a survey by the joint House-Senate Economic Committee, headed by Grover W. Ensley. The committee report enumerates intra-European deficiencies: "Increases in productivity are viewed with alarm (in Europe) because of possible effects on employment; feather-bedding and other restrictive practices are rampant; production techniques are guarded as carefully as military secrets; distribution methods have not changed in centuries . . ."

Work for Less—Support for the view that Europeans could do much to help themselves without American aid comes from many other quarters. For example, John A. Jones, Weirton Steel Co., came back from Europe to say European management works harder than American management but accomplishes less. The reasons, says Mr. Jones: European management is understaffed, less efficient and lacks well-grounded young men to take over lower-echelon work.

Even the introduction of modern American techniques has not brought European productivity up to U. S. standards. "The ideas of standardization and interchangeability of parts have caught hold firmly in Europe," says Jervis C. Webb, president of Webb Co., Detroit conveyor manufacturer. "Nevertheless, despite our high labor rates and more elaborate working conditions we beat the Europeans cost-wise.

Another Lesson — "Part of the answer is volume, but more, we suspect, the secret is our mechanized in-plant handling which creates the timed flow of subassemblies and final assemblies from raw material to finished product . . . . the Europeans have not yet learned the rhythm of continuous flow."

While the basis for comparison between American and European industry may vary, the results invariably point in the direction indicated by the Ensley report: "While outside markets such as the U. S. are important, their importance appears exaggerated. She (Europe) should not look continually to the U. S. for economic assistance unless she is willing to tackle her own basic structural problems."

Denationalization Goes Well

During the first 12 days that stock was offered for sale in United Steel Companies Ltd., first big British steel firm to be resold to private investors, applications for about 40 million shares were received. Only 14 million shares were in this first United offering.

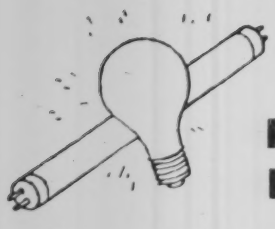
Thus denationalization of the British steel industry promises to be much easier than anticipated. About 80 companies, which the government bought for nearly $670 million in February, 1951, are to be sold back to private owners under the program.

U. S. Counterpart in Brazil

Firth Sterling Inc., Pittsburgh, has completed arrangements for the formation of a Brazilian counterpart of Firth Sterling in Sao Paulo. Plans are underway for the construction of a plant to produce sintered tungsten carbides in Brazil utilizing local raw materials. The plant will be designed and operations supervised in the early stages by Firth Sterling technicians. The new Brazilian company will begin by importing Firth Sterling products early next year. These imports will be more than offset by Firth Sterling's purchases in Brazil so that a favorable balance of trade will accrue to Brazil.

How Close Did Germany Come to Winning World War II?

Germany came very close to winning the war in the air in the closing days of World War II, says Willy Messerschmitt (right). Mr. Messerschmitt says he produced 600 to 800 Me-262, 560 mph, turbojet fighters in 1944 that topped anything the Allies had in the air. "Had the war continued," he says, "the Me-262 might have turned the tide of battle." Messerschmitt is now building wooden furniture and automobiles in Germany; one auto he designed weighs only 360 pounds and costs about $500. He was a guest in California of Victor F. Pastushin, president, Pastushin Aviation Corp. (shaking hands) for a week. Looking on are E. F. Horkey (left), Pastushin chief engineer, and Prof. Georg Madelung, of Stuttgart, Germany, who accompanied Mr. Messerschmitt to the U.S.



Recommended Illumination

(Footcandles measured at task or 30 inches above floor)

AUTOMOBILE MANUFACTURER	
Body manufacturing and frame assembly	30
Assembly line	100
Finishing and inspection	200
ELECTRICAL EQUIPMENT MANUFACTURE	
Impregnating	30
Testing	50
Insulating and coil winding	100
FOUNDRIES	
Annealing, pouring, sorting, storage, cupola, shakeout	10
Cleaning	20
Medium core making	25
Grinding, chipping, large molding, medium inspection	30
Fine core making, medium molding	50
Fine inspection	100
MACHINE SHOPS	
Rough bench and machine work	20
Medium bench and machine work, ordinary automatic machines, rough grinding, medium buffing and polishing	50
Fine bench and machine work, fine automatic machines, medium grinding, fine buffing and polishing	100
Extra fine bench and machine work	200
PLATING	10
SHEET METAL WORKS	
Ordinary bench work, presses, shears, stamps, spinning	20
Punches	25
Tin plate inspection	50
Scribing	100
STRUCTURAL STEEL FABRICATION	10

Industry Sees the Light

Improved quantity and quality of lighting in America's factories mean increased sales for fixture makers. Fluorescent lamps are coming into more general use

"BETTER LIGHT for better sight" could well be the motto for light fixture manufacturers as they strive for a $235-million output this year, up about $10 million from 1952 but down from the record year of 1951 by about $53 million. It is largely the stress on higher footcandle illumination levels, notably in the steel and metalworking industries, that is setting the pace this year for fixtures, both fluorescent and incandescent.

Since World War II, there has been a steady increase in illumination levels for industry. Many operations using 10-20 footcandles before that time now require 30-50 footcandles. Illuminating Engineers Society has revised its standards for metalworking (see the accompanying table), and improved lighting equipment has been a factor in its recommendations.

More Light, Less Shadow—Fluorescent equipment, with fixtures directing 10 to 30 per cent of the light upward against the ceiling, is increasingly popular. During 1951, when both industrial expansion and private homebuilding were reaching peaks, about 11.2 million units were produced, with 5.3 million going to industry. In 1952, total output of fluorescents was down to 8.1 million units, with only 3.3 million going to industry. This year, with industrial expansion and homebuilding well past their peaks, production is down to 7.9 million, but industry will increase its take to 3.4 million.

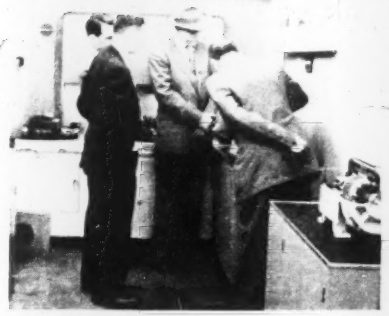
Most widely used fluorescent fixture is the porcelain enameled, two-lamp type, which accounts for over half of production. Slotted white porcelain enameled reflectors used in those units are easily maintained, and less light is wasted.

Engineered — Each industrial lighting installation should be engineered, because there are no two jobs alike. Factors to be considered are: Plant size, ceiling height, room finish, task or operation to be performed, machine surface color, speed and time, safety, productivity and environment. There are four major types of arrangements for industrial plants: Direct, semi-direct, indirect and semi-indirect.

Improvement in plant lighting frequently increases production 5 to 25 per cent, but an abundance of light does not in itself mean good lighting. Quality must also be considered. This involves uniformity of distribution, diffusion, direction, absence of glare, brightness ratios and color of light.

Even with the emphasis on directing more light upward with fluorescent fixtures, industrial lighting is still largely direct type. In addition to general lighting, supplementary illumination may be required for difficult tasks such as inspecting.

Long Way To Go—With the amount of expansion still anticipated in industry, plus potential modernization, the approximately 200 lighting fixture manufacturers can expect a good, competitive market for some time to come.



Reliance Electric

Mobile Showrooms Move the Goods

Portable exhibits have their problems, but those who have used them claim it is worth the effort. Method opens up territories previously undeveloped

"HARD SELLING in good times means good selling in hard times," a metalworking executive told his salesmen. "Hustle will have to replace easy-going habits," continued W. Cordes Snyder Jr., president of Blaw-Knox Co., Pittsburgh.

Curtain Rises — Substituting "hustle" for complacency, a growing list of companies are taking their products to virgin sales territory by means of traveling exhibits.

F. R. Dickenson, president of Townsend Co., New Brighton, Pa., believed his firm had not yet tapped the full market potential for cold-formed products. Now Townsend has portable displays which can be set up quickly for a prospective customer. Yale & Towne Mfg. Co., New York, wanted to show more small companies how materials handling equipment could serve them. This year two specially-built trucks carried a Yale & Towne exhibit 20,000 miles throughout the U. S., Canada and Mexico.

Sales Drive — Traveling shows today have a twin function—entertainment and education. They have one aim—to broaden sales. General Motors Corp., Detroit, entertains and informs the man in the street with a touring display of progress in automotive engineering. Circus-style tents and barkers attracted 1,420,847 persons through the twentieth city. Information is on the layman's level.

"Industrial selling has never been simple," declares James H. Jewell, vice president in charge of sales for Westinghouse Electric Corp., Pittsburgh. "Selling strategy must match buying habits which change from industry to industry." Westinghouse builds sales by exhibits in each division of consumers products. A central staff co-ordinates the program.

Reaching the Engineer—A specialized approach, rather than mass appeal, is the goal of Reliance Electric & Engineering Co., Cleveland. Two mobile exhibits of electric motors, motor drives and controls are used in discussions of production applications with engineers, mangement and maintenance men. Reliance's district men assist with showings for prospective customers.

Hard selling in good times is exemplified by Yale & Towne's decision to demonstrate its equipment before the industrial public. The firm's show is nontechnical, the general public is welcome, but special efforts are made to interest businessmen in each locality.

Inauguration—When Yale & Towne's show was begun in February, 1953, Vice President Elmer F. Twyman said, "The only thing that has retarded wider application of modern materials handling operations, particulary in smaller plants, has been the lack of awareness in many places of what modern handling equipment can do. We hope to take the lesson home to industry." Now, with the show in winter quarters, Yale & Towne labels it a success.

Most firms feel the intangible advantages of conducting exhibits outweigh the expense and difficulty involved. Displays need not be complicated to set up or costly at least one exhibit consists of a background developed by a display house and a footlocker holding the company's products. Other difficulties industry takes into account are delegating skilled engineers to accompany the show and finding an acceptable hard surface on which to set up the exhibit.

New Firms—Gratifying results reported by such firms as Townsend and Reliance Electric are encouraging other companies to plan mobile units. General Electric Co.'s Chemical Department, Pittsfield, Mass., recently announced a new workshop for demonstrating plastics surfacing had embarked on a national tour. Following the slogan of "Hard selling" more and more companies are taking to the road to show off their wares.

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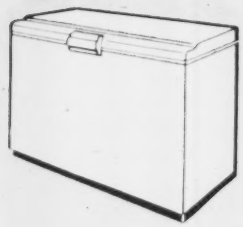
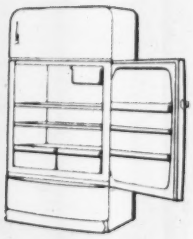
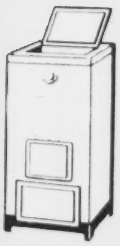
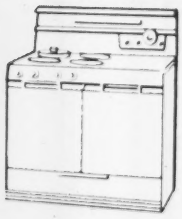
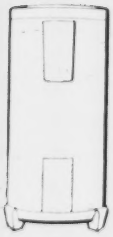
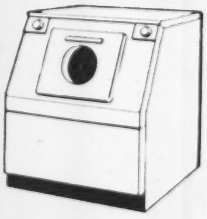


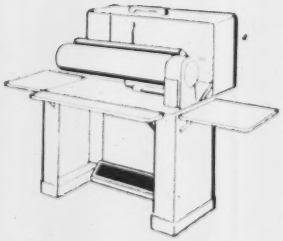












N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections resulting in lighter weight of products, yet with greater resistance to denting. It is a low-alloy steel possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values and the abrasion resistance of a medium high carbon steel resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, less surface preparation is required for either painted or plated parts.

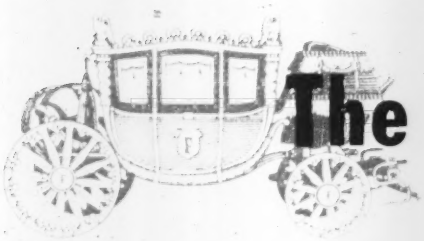
Your product can be made lighter, resulting in shipping economies to consumer . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Michigan

NATIONAL STEEL CORPORATION

KEEP YOUR SCRAP MOVING TO YOUR DEALER



The Fisher Body Story

LIKE MOVIE QUEENS, there's more than meets the eye in an automobile Body by Fisher.

From the humble beginnings, Fisher Body Co. as organized by Fred and Carl Fisher in 1908 to the present-day Fisher Body Division of General Motors, styling and body lines have been only half the story; steady improvements in production techniques, engineered safety and comfort in body design form the other half.

An Inside Job—A brief glance at the original Fisher company shows it got the first "big" order for closed bodies ever placed in America in 1910 of 150 units for Cadillac, beginning an association between the industry's biggest body builder and the industry's biggest car builder that was to last through the years.

Within the next six years Fred and Carl brought several other innovations to automobile body building: Use of rubber weather strip to keep the wind and rain out of mama's duster; use of steel-faced dies to draw sheet metal parts; development of steel body presses; use of solid steel panels in body construction.

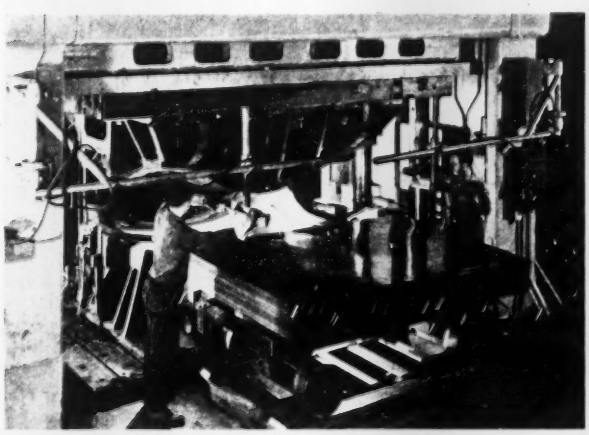
Color Crazy—In 1923 Fisher began use of lacquer instead of paint and varnish for car bodies enabling Harry Horsepower's brother-in-law, Ferris Fop, to order and get a tangerine-red convertible with pea-green trim.

Avowed purpose of the Fisher brothers when they formed their company was "to build what the public wants," which, they cogitated, was a closed body at a price the public could afford to pay. By 1924, five years after General Motors bought a three-fifths interest in Fisher, output of the body firm jumped from 135,000 to 575,000 units a year, supplying bodies for the entire GM line.

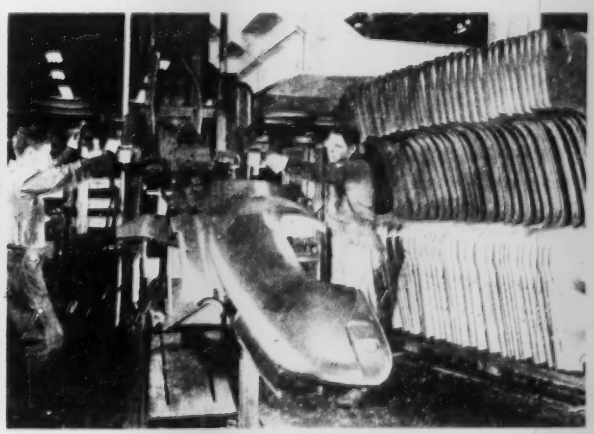
Less Than Half—A year later, output passed the million-unit mark and it seemed the dream of the Fisher brothers had come true. In truth, it was less than the half-way point.

Latter-day improvements enabled Fisher to remain among the challengers in any group of automobile body builders: Built-in window regulators for closed cars; flash welding in body construction; a new-type sill plate to seal the joint between the door and the floor. The ubiquitous adjustable sun visor first appeared on a Fisher body and so did the cold rolled door hinge.

Flow of Firsts—In 1933 came what some call Fisher Body's most outstanding contribution to body construction no draft ventilation, accomplished through an ingenious



One blow of this huge press forms the steel top for a new Fisher body. Like an iceberg, more of this press is hidden beneath the floor than can be seen



A special resistance welding machine welds part of a rear fender at the new stamping plant opened by Fisher Body Division, General Motors, at Pittsburgh

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Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,471	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	611,152	322,755
September	605,228	595,715
October	651,153	656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Oct. 17	152,743	138,088
Oct. 24	149,794	144,747
Oct. 31	145,311	155,037
Nov. 7	133,783	143,610
Nov. 14	115,861	146,825
Nov. 21	111,000*	129,224

Source: Ward's Automotive Reports
*Estimated by STEEL

arrangement of windows to baffle air currents through the car; in 1935, the one-piece turret top and in 1936 the "Unisteel" body formed by welding the inner and outer panels into one structure. A few years later, Fisher became the first manufacturer to use U-shaped cross bows to reinforce the solid steel top. Even this does not complete the list of Fisher Body contributions to automobile body building.

Though building closed bodies as a General Motors' division since 1926 when GM bought its outstanding minority interests, Fisher Body over the years has built car bodies for a long list of other automakers, too: Chalmers, Chandler, Chrysler, Churchfield, Cleveland, Dodge, Essex, Ford, Hudson, LaSalle, Maxwell, Marquette, Oakland, Peerless, Regal, Scripps, Booth, Studebaker, Viking and Wills St. Clair, not forgetting Fisher-Fleetwood custom-made bodies and bodies for taxi cabs.

Captive Goliath—Now, of course, Fisher builds only for the GM cars—Chevrolet, Pontiac, Oldsmobile, Buick and Cadillac. And instead of one million units a year, the Fisher division makes closer to two-and-a-half million. In the typical postwar year of 1949, for example, Fisher produced 2,285,000 bodies; in 1951, it made 2,815,248.

This amazing growth has brought a host of problems which Fred and Carl Fisher could have hardly imagined when they founded their two-man company. The present Fisher Body Division, composed of 22 domestic assembly plants in 20 separate cities, takes total raw material and parts shipments of about 2600 railroad cars, or the equivalent of 26 trains 100-cars long, every week.

Follow-Up and Push—That necessitates a special department, the follow-up and push boys, which operates on a three-shift, around-the-clock basis to expedite materials into and between the various plants. No attempt is made to do the almost impossible job of following through on every shipment in each plant. It's only when trouble occurs that the follow-up and push is employed. But then it must be swift and effective. All Fisher Body plants operate on a one-and-a-half to two-day inventory; any supply stoppage is quickly reflected in reduced output. Routine is the job of finding lost railroad cars and breaking them out of tie-ups in marshaling yards.

More intricate is the job of delivering the automobile body to the car division for which it was built at the exact moment it is needed. Over-all, production is governed by a continuing check on dealers' stocks to be sure the quantities of each body type produced match the customer demands. From that study monthly and weekly body-building schedules are made up, passed along to assembly plants where the breakdown is made to a daily basis.

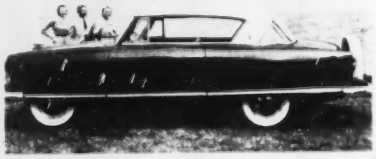
Close Co-ordination—Fabricating plants, supplying the necessary stampings and parts, are co-ordinated into the process by means of duplicate copies of set-up schedules. As a double check, a copy of each fabricating plant's shipping schedule is forwarded to the assembly plants, listing the type and quantity of parts being made and shipping timetable.

A Materials Control & Handling Section watches shipment of parts from stamping to assembly plants and keeps the pipelines full. When plenty of shipping space is available, it's not much of a problem. But when 50 railroad cars are needed and aren't there, fireworks begin. Another entirely different unit—the Traffic Section—has the responsibility of speeding up the unloading and return of freight cars.

Fisher Future — Tremendous growth and new problems have not stopped the flow of firsts from Fisher Body, though. Fisher Body Division led the way in the automotive industry by bringing about the interchangeability of many body parts and stampings throughout GM cars. And additional innovations can be looked for from Fisher as more than 80,000 square feet of floor space, as well as the vast General Motors Proving Ground, are available for testing the design and construction of bodies for GM cars, and literally millions of dollars are invested each year in the more than 80 different styles of Bodies by Fisher.

Exhaust Note . . .

Remember the DKF-161 Kaiser sports car? The Darrin roadster is still undergoing work at Jackson, Mich. Seems that the prototype turned up with a few bugs when production was imminent that caused polyester fester or some plastic disease that called for redesign work. A sneaked-peek at the new version reveals little external change, and tentatively the cars should be making their debut with the new models.



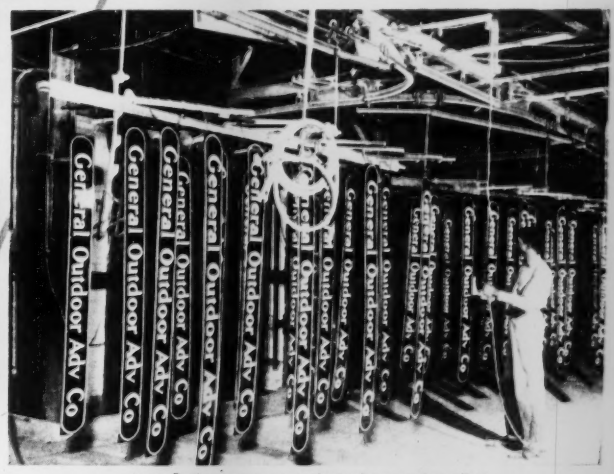
Nash for 1954

The all-new Nash Rambler four-door sedan (above) designed by Pinin Farina is major addition to Nash line. Country Club hardtop (below) has been lengthened, sports an outside tire

MONORAIL eliminates rehandling

moves ware through all processes in porcelain enamel plant

MonoRail over furnaces allow rapid in-out movement. Carriers made of special alloy withstand temperatures up to 1800° F.

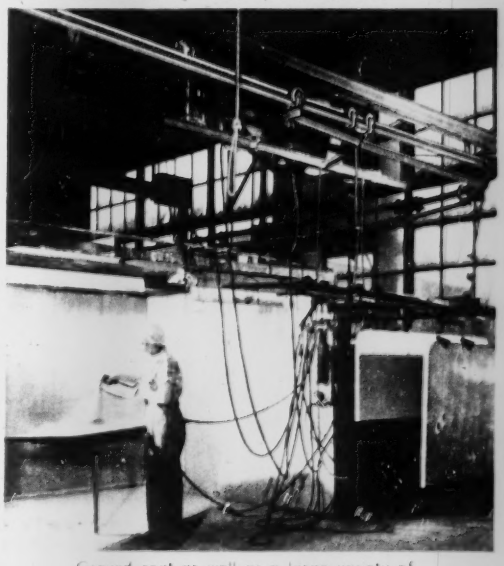


MonoRail carries ware throughout entire plant with no rehandling from special carriers.

From start to finish, spraying to drying to firing furnaces and finally to storage one single MonoRail system provides a continual flow operation at this porcelain enamel plant. The same racks loaded at the spray booths carry the ware into and out of firing furnaces. Many of the handling operations once unavoidable are now eliminated. Savings in labor alone has fully justified the investment in this system. And true of all American MonoRail Overhead Handling Installations is the extremely low maintenance cost.

Why not let an American MonoRail engineer give you all the facts about savings and advantages?

SEND FOR BULLETIN C-1



Ground coat as well as a large variety of colors are used. Ware is hung on special MonoRail carriers after spraying.

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

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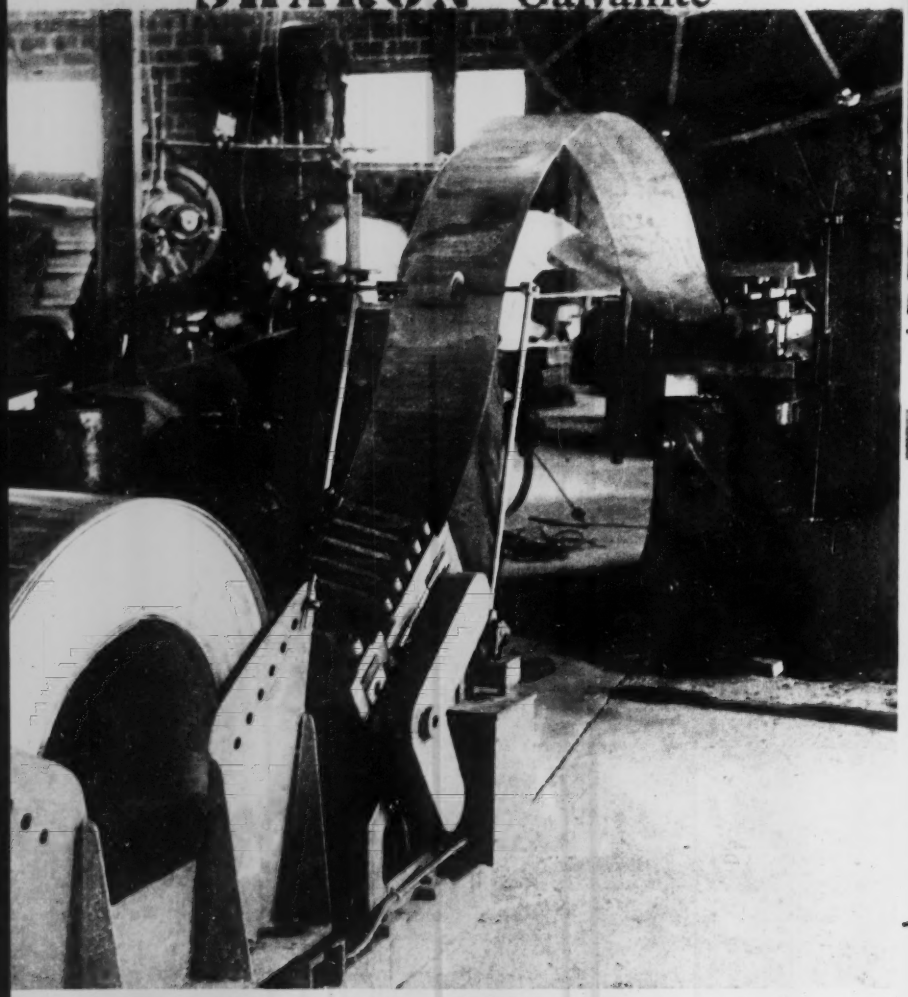
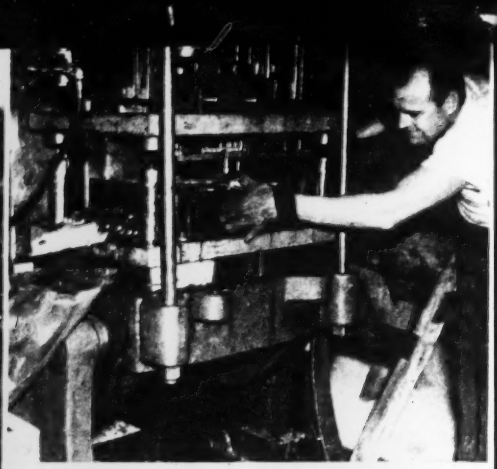
SHARON Galvanite*



Strip Galvanite* automatically fed into press . . .



where multi-station die quickly forms . . .

a special T-V bracket.

T-V Parts Manufacturer Improves Quality Speeds Production with Galvanite* Strip

Brackets and set bases for radio and television sets obviously must remain free of rust year after year. That's why almost every leading manufacturer of sets specifies a coated material of some description be used in the manufacture of these vital parts.

Recently parts manufacturers, after comparative tests, have switched to Galvanite*, Sharon's highly effective, rust-discouraging special process, zinc coated steel.

Further, Galvanite* in strip form† enables these manufacturers to produce directly from the coil, eliminating extra handling costs. The seven-station die, being used by this manufacturer, is typical of this trend in production methods, into which strip Galvanite* fits so perfectly.

†Available in large coils and cut to length.

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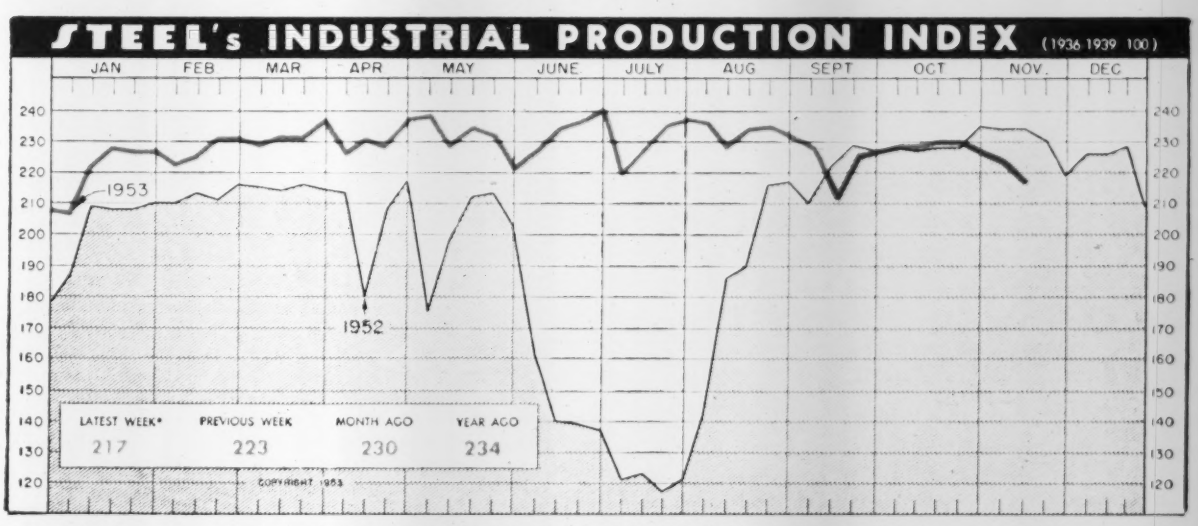
*Trade name copyrighted by the Sharon Steel Corporation

Send for your copy of Sharon's New Galvanite* Handbook.

SHARONSTEEL

Wherever Rust is a Problem . . . Specify Galvanite

SHARON STEEL CORPORATION *Sharon, Pennsylvania*



*Week ended Nov. 14 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%

Cuts in Auto Production Trim Industrial Pace

SEASONAL DOWNTURN in industrial output was accelerated during the latest week.

In the week ended Nov. 14, STEEL's industrial production index registered a preliminary 217 per cent of the 1936-1939 average. Outturn was down 6 points from the preceding week, chiefly due to the sliding automobile output.

With the exception of holiday weeks, the production level during the week was the lowest for the year to date.

Besides seasonal influences, primary causes of present output reductions are the declines in government and capital expenditures and the reduced pace of inventory accumulation.

Defense Dip Moderate? . . .

Probable effect of further reductions in government expenditures next year is seen to be moderate by Walter Williams, under secretary of commerce. He says that present spending for security purposes has been running at the approximate rate of 15 per cent of total production output, contrasted to a peak of 42 per cent of total output during World War II. And the reduction in defense expenditures appearing to be in immediate prospect is from 15 to perhaps 10 per cent of total output, compared with the 27 per cent drop in total production in approximately 18 months of the immediate postwar period which our economy took in stride.

Employment Cutbacks . . .

Of course, conditions then and now are different in many respects. Nonfarm employment in October, estimated at 49.6 million by the Bureau of Labor Statistics, was at an all-time high for the month, although slightly down from September. Employment advanced over the previous month in retail trade and in state and local government but declined in manufacturing by 200,000. The decrease in factory employment, after allowing for seasonal factors, continued for the third consecutive month and was one of the largest declines for this time of year in recent years. Also, only 22 per cent of manufacturing wage earners worked more than 40 hours during the week compared to 29 per cent in October, 1952, the Bureau of the Census reports. The reductions affected both durables and nondurables.

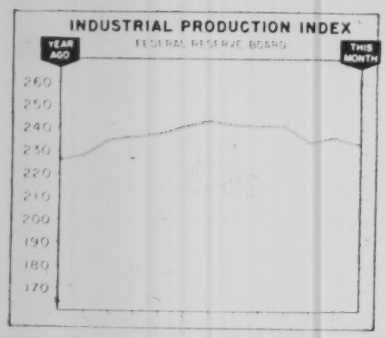
Layoffs Up; Hiring Down . . .

Indicative of the employment leveling-off in recent months is the rate of labor turnover in manufacturing industries. Layoffs, which had been at generally low levels during the last three years, have been rising since midyear and climbed from 13 to 15 per 1000 employees between August and September, according to the Bureau of Labor Statistics. The increase, most prominent in the durable goods industries, reflects some reduction from peak output levels in the automobile, machinery and primary metals industries.

September hiring rates also declined, from 43 to 40 per thousand, a rate lower than earlier postwar Septembers. Among industries with lower hiring rates were lumber, furniture, primary metals, transportation equipment, instruments, food, textiles and paper.

GNP Dips Slightly . . .

The market value of the nation's output of goods and services, at a

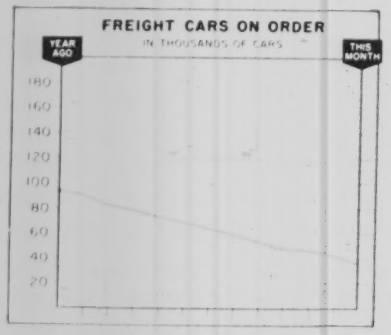


Industrial Production Index

1935-1939=100

	Total Production 1953	Total Production 1952	Iron, Steel 1953	Iron, Steel 1952	Non-ferrous 1953	Non-ferrous 1952
Jan	236	220	287	261	249	215
Feb	240	222	290	261	259	217
Mar	243	220	297	262	261	218
Apr	241	216	292	245	264	218
May	240	211	291	245	263	220
June	240	203	288	142	258	212
July	233	193	279	141	251	201
Aug	235	215	277	241	256	212
Sept	232	225	266	267	247	221
Oct		227		276		228
Nov		231		283		240
Dec		235		287		245
Avg		218		243		220

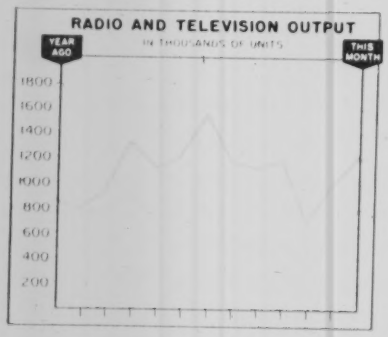
Federal Reserve Board



Freight Car Awards and Backlogs

	Awards 1953	Awards 1952	Backlogs* 1953	Backlogs* 1952
Jan	5,536	5,338	77,414	120,251
Feb	2,284	7,358	71,883	118,900
Mar	3,379	5,619	68,563	115,584
Apr	2,432	397	62,637	108,270
May	1,651	2,502	57,345	103,910
June	1,163	3,264	52,315	99,615
July	1,632	1,536	47,423	95,265
Aug	3,913	4,568	45,735	95,761
Sept	3,914	3,628	42,198	95,377
Oct	1,705	1,423	36,171	90,708
Nov		2,878		87,657
Dec		1,150		80,296
Total		37,261		

*End of month.
American Railway Car Institute

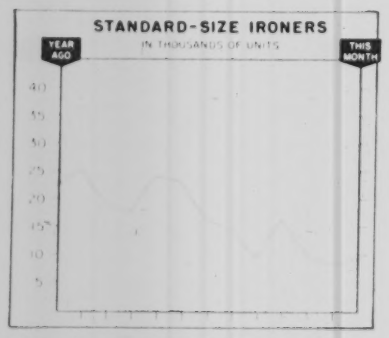


Radio and Television Output

Thousands of Units

	Radio 1953	Radio 1952	Television 1953	Television 1952
Jan	1,093	632	719	405
Feb	1,192	709	731	409
Mar	1,549	976	810	511
Apr	1,158	848	568	323
May	1,109	748	482	309
June	1,161	871	524	361
July	674	442	316	199
Aug	992	544	604	398
Sept	1,217	866	770	756
Oct		772		721
Nov		924		750
Dec		1,325		921
Total		9,711		6,096

Radio-Electronics-Television Mfrs. Assn.



Standard-Size Ironers

Factory Sales, Units

	1953	1952	1951
Jan	21,376	15,636	24,600
Feb	22,586	17,630	32,400
Mar	16,066	13,913	34,700
Apr	11,080	8,938	23,700
May	9,323	12,652	24,200
June	12,529	17,654	24,500
July	5,626	15,025	11,100
Aug	8,067	16,177	17,200
Sept	9,115	22,492	18,300
Oct		25,204	29,800
Nov		19,724	20,500
Dec		16,788	16,900
Total		202,143	277,700

American Home Laundry Mfrs. Assn.

Charts Copyright 1953 STEEL.

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 2	Gray Iron Castings	Oct. 19	Refrigerators	Nov. 2
Durable Goods	Oct. 12	Machine Tools	Oct. 5	Steel Castings	Oct. 19
Employ., Metalwk.	Nov. 9	Malleable Castings	Oct. 19	Steel Forgings	Oct. 19
Employ., Steel	Oct. 26	Prices, Consumer	Sept. 28	Steel Shipments	Oct. 12
Fab. Struc. Steel	Nov. 16	Prices, Wholesale	Nov. 2	Vacuum Cleaners	Oct. 12
Foundry Equip.	Nov. 16	Pumps	Nov. 16	Wages, Metalwk.	Nov. 9
Furnaces, Indus.	Sept. 14	Ranges, Elec.	Nov. 2	Washers	Nov. 9
Gears	Nov. 16	Ranges, Gas	Oct. 12	Water Heaters	Nov. 9

seasonally adjusted annual rate of $369 billion during the third quarter, $3.5 billion below the preceding quarter, will decline further during the present quarter. In the third quarter, the dip in gross national product was due largely to a reduced rate of inventory accumulation, the Office of Business Economics says. In the present quarter further inventory reductions will be joined by a moderate decline in both government and capital expenditures. Continued expansion of personal consumption expenditures, from a seasonally adjusted annual rate of $230.4 billion during the second quarter to $231 billion during the third quarter, was the bigest factor in restraining an even larger quarterly decline in gross national product.

Income Still Rising . . .

Although GNP declined in the third quarter, personal income rose by about $2 billion from the second quarter to a seasonally adjusted annual rate of $286.5 billion in the third. Result of the rise in personal income was a gain in personal saving, which rose by $600 million to reach a seasonally adjusted annual rate of $18.8 billion.

Savings: The Last Resort . . .

The $369 billion of liquid assets held by the personal sector of the economy at midyear appears to be a tremendous reservoir of unused purchasing power that could halt a serious business decline. But, says the National Industrial Conference Board, only part of this sum—currency, demand and savings deposits, savings and loan shares and U. S. savings bonds—would likely be used. And that part is larger than ever before.

Credit Rise Not Alarming . . .

Consumer credit, one means of financing personal expenditures, is not overextended when viewed in relation to the economic factors affecting it, says Dr. Robert Bartels of Ohio State University. Present consumer debt remains only 10 per cent of consumers' disposable income. This compares with consumer debt of 10.7 per cent in 1940, 9.2 per cent in 1951 and 9.9 per cent in 1952. And over the

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	92.5	93.5	106.0
Electric Power Distributed (million kwhr)	8,457	8,398	7,884
Bitum. Coal Output (daily av.—1000 tons)	1,471	1,520	1,659
Petroleum Production (daily av.—1000 bbls)	6,050	6,130	6,622
Construction Volume (ENR—millions)	$251.7	$152.8	$411.5
Automobile, Truck Output (Ward's—units)	115,864	133,783	146,825
TRADE			
Freight Car Loadings (unit—1000 cars)	735[1]	748	829
Business Failures (Dun & Bradstreet, no.)	155	207	148
Currency in Circulation (millions)[3]	$30,540	$30,428	$29,905
Dept. Store Sales (changes from year ago)[3]	+3%	2%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,115	$17,490	$14,950
Federal Gross Debt (billions)	$275.0	$273.4	$264.9
Bond Volume, NYSE (millions)	$14.9	$13.3	$19.8
Stocks Sales, NYSE (thousands of shares)	5,718	6,253	5,893
Loans and investments (billions)[4]	$79.4	$79.5	$77.0
U. S. Gov't Obligations Held (billions)[4]	$31.7	$31.7	$32.3
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	204.6	204.3	215.4
All Commodities[7]	109.9	109.9	110.7
Commodities Other Than Farm & Foods[7]	114.5	114.5	112.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,450; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

longer term of 15 years, greater use of consumer credit has really been made necessary by a rise in the standard of living and in prices. Thus consumer debt today, after a rise of 85 per cent in prices, amounts only to $164.28 per capita, compared with $111.20 then.

Credit Lines Down . . .

Robert L. Oare of the executive committee, American Finance Conference, says that recent increases in the volume of automobile credit outstanding are directly attributable to lengthening of the payment period and not due to an actual substantial increase in the amount of credit extended. The amount of credit extended by sales credit companies and commercial banks in May, 1953, was $35 million below May, 1952, and in June, 1953, it was $106 million below June, 1952, according to FRB figures. Credit outstanding continued to rise during these months, however, because of the lengthening of the payment period from 16 months, under Regulation W, to an average term of about 20 months.

Cash Dividends Slide . . .

With corporate net income up this year, compared with 1952, and with an increase in the number of shares outstanding, cash dividend payments have been higher than last year. Cash dividend payments by corporations issuing public reports amounted to $553 million in October, 2.5 per cent above the amount paid out in the same month a year ago, the Office of Business Economics reports. For the first ten months, cash dividend payments amounted to $6,598 million, 4 per cent more than the same month in 1952. In this period manufacturing corporation dividends rose only 1.5 per cent, while nonmanufacturing disbursements were 7 per cent higher than in the corresponding period of last year.

Trends Fore and Aft . . .

Approximately 115 million pounds of plastics of all kinds will be consumed in the production of approximately 4 million electric refrigerators in 1953, says Lee H. D. Baker, vice president for appliances, Admiral Corp. . . . Only three of the seven publicly-owned motor car producers, GM, Packard and Nash, have shown earnings thus far in 1953 proportionate to the second highest sales-production year in the industry's history. Privately-owned Ford obviously had a near-record nine months earnings.

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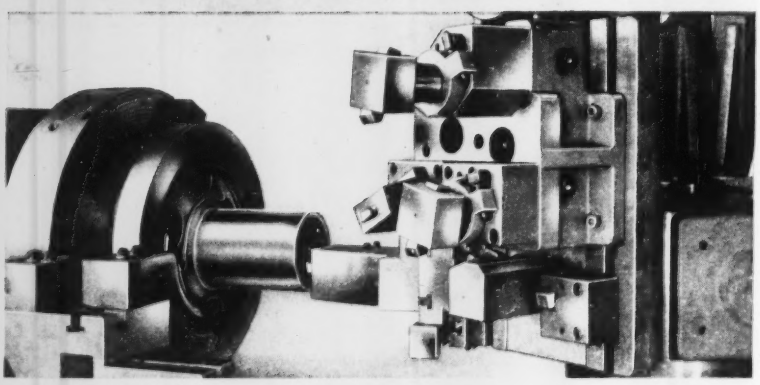

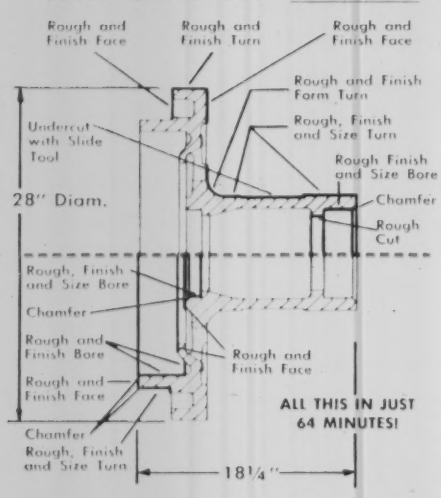

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SAN FRANCISCO
EXPORT DEPT., PAWTUCKET, R. I.
AGENTS: DALLAS, THE STANCO CO.
HOUSTON, WESSENDORFF, NELMS & CO.

WAYNE F. STRONG
. . . Iron Fireman v. p.-mfg.

LEE E. CUCKLER
Fielden Instrument engineering mgr.

E. E. ESGATE
Thew Shovel v. p.

Iron Fireman Mfg. Co., Cleveland, elected **Wayne F. Strong** vice president in charge of manufacturing to head production in plants located in Cleveland, Portland, Oreg., and Toronto, Ont. At its electronics division in Portland, **Robert V. Jack**, assistant manager, was promoted to manager.

Philip H. Ordway now heads **Union Steam Pump Co.**, Battle Creek, Mich., as president and general manager. Vice president since 1946, he succeeds his father, **Earle P. Ordway**, who becomes board chairman. **George N. Bailey** was made assistant general manager in addition to his duties as vice president, secretary and treasurer.

M. D. Burrows was appointed chief engineer of Food Machinery & Chemical Corp.'s **Bolens Products Division**, Port Washington, Wis. He replaced **W. J. Adams Jr.**, promoted to the corporation's central engineering department at San Jose, Calif.

Barber-Colman Co., Rockford, Ill., appointed **Robert A. Horner** divisional manager for its machine and small tool divisions. He is succeeded by **Leo W. Reuland** as sales manager for the divisions. **Fred B. Jensen** replaces Mr. Reuland as production manager, small tool division.

Lee E. Cuckler was appointed manager, engineering department, Fielden Instrument Division, **Robertshaw-Fulton Controls Co.**, Philadelphia. He will be responsible for all application engineering and technical services.

Daco Machine & Tool Co., Brooklyn, N. Y., appointed **Henry M. Aldrich** as director of sales. He was formerly with Reeves Instrument Corp. as a divisional sales manager.

James S. Anderson was made general sales manager, tubular products division, **Babcock & Wilcox Co.**, Beaver Falls, Pa., where **Robert E. Halloran** fills the newly created position of manager of mechanical sales.

A. M. Harrison becomes manager and **P. G. Lessmann** assistant manager, transportation and generator engineering department, **Westinghouse Electric Corp.**, Pittsburgh. In the apparatus division, **Maynard B. Wyman** is manager and **H. C. Coleman** assistant manager of the newly created engineering and service department.

United States Steel Homes Inc., New Albany, Ind., subsidiary, U. S. Steel Corp., appointed **Charles Landers Jr.** assistant to sales vice president. He will have offices in Washington.

E. E. Esgate was elected a vice president of **Thew Shovel Co.**, Lorain, O. He joined the company in 1949 as assistant to the general manager and has been active in all phases of company operations since that time.

Otis L. Johnson was appointed sales manager of Tann Corp.'s **Congress Drives Division**, Detroit, with which he has been associated for seven years, recently as assistant sales manager. His sales activities will be directed to users of V-belt drives and diecastings.

Hugh M. Corrough was made general manager of operations of **Graver Tank & Mfg. Co.** with headquarters at East Chicago, Ind. He was formerly with American Locomotive Co.

Charles V. O'Hare was promoted from assistant manager to manager of the San Francisco plant of **Connor Spring Mfg. Co.**

Wagner Electric Corp., St. Louis, appointed **Harold S. Garrett** assistant director of purchases and production planning and **Harold K. Kramer** purchasing agent.

William E. Johnson was made sales manager, New York branch, **Automatic Transportation Co.** He replaces **George A. Hinckley**, recently named a sales manager of Au-

FORREST F. HINKLEY

HORACE B. FERGUSON

. . . appointed to positions at Aeroquip Corp.

tomatic with headquarters in Chicago.

Forrest F. Hinkley is now director of subsidiary operations, and **Horace B. Ferguson** is director of purchasing at **Aeroquip Corp.**, Jackson, Mich. Mr. Ferguson replaces Mr. Hinkley, who was previously director of materials and has been an Aeroquip executive for the last eight years.

Harry R. Bohme was appointed purchasing agent of **Kaiser Steel Corp.'s** Sunnyside, Utah, coal mine, replacing **Andrew J. Pratt,** named senior buyer in the purchasing department, Fontana Works.

Metals Disintegrating Co., Elizabeth, N. J., elected **Julius F. Sachse** vice president-research and development. He was vice president-works manager of the Elizabeth plant. In his new duties he is concerned in expanding development of commercial applications of powder metallurgy. **George H. Tulley** was made sales manager of powdered metals at Cleveland.

A. M. Neumann was appointed chief engineer of **National Lead Co.'s** Evans Lead Division, New York. He succeeds **William F. Schadel,** retired.

At **Reliance Steel Division,** Detroit Steel Corp., **Ivan M. Bridges** was made manager of the new regional sales office at Des Moines, Iowa, and **Edward J. Mistecki** was assigned to the Chicago sales department. Mr. Bridges formerly was purchasing director of C. E. Erickson Corp.

J. P. Cummings, who joined Chrysler Corp., Detroit, in 1930 and since May of this year has served as assistant to the chief engineer of **Chrysler Corp. of Canada,** was promoted to chief engineer.

Scovill Mfg. Co. appointed **Warren F. Bice** manager of industrial fastener sales for its Waterville, Conn., division.

Ray F. Ellis was appointed director of sales and **Burleigh L. Owens** director of marketing of Borg-Warner Corp.'s **Atkins Saw Division,** Indianapolis. Both Mr. Ellis and Mr. Owens are long-time members of the Atkins sales organization and were until recently assistants to the vice president-sales.

Alton W. Bardeen, former chief metallurgist of **Ohio Brass Co.,** succeeds the late **R. W. Parsons** as technical director of the Mansfield, O., plant.

S. V. V. Hoffman was appointed West Coast sales district manager, **Raybestos-Manhattan Inc.** He continues headquarters at Los Angeles.

Worthington Corp., Harrison, N. J., appointed **Kenneth W. Horsman** general manager of its Plainfield, N. J., Works and **Paul J. Foley** general sales manager for all Plainfield Works products. **John F. Weissert** was made general superintendent of plant operations there. **W. J. Fleming** was transferred from Plainfield to the Holyoke Works, in charge of the sale and distribution of portable air compressors and air tools.

William F. Ruehl was named sales representative by **Miller Electric Mfg. Co.**, Appleton, Wis., for the eastern part of the country.

Henry Throop, associated with U. S. Steel Corp. since 1947, was made Idaho sales representative of its **Columbia-Geneva Steel Division** with headquarters in Boise.

Joseph O. Young was promoted from general manager of branch operations to vice president in

RAY F. ELLIS

BURLEIGH L. OWENS

. . . sales and marketing directors at Atkins Saw Div.

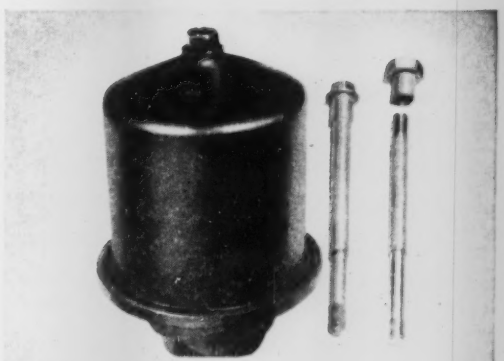
Here's where Purolator screened out rising costs

● Purolator makes oil filters for a prominent auto maker. They're top-notch filters that do a tough job well. Purolator and the car manufacturer are both proud of them.

Not long ago an RB&W "fastener engineer" got loose in the Purolator plant—just when company production executives were looking for a way to lick rising costs. He noticed that the Purolator filter was being assembled with a two-piece fastener made slowly and laboriously on a screw machine.

Our man told the Purolator people about RB&W's batteries of cold-forming machines. Purolator wanted to know more. Now their filter is assembled with a one-piece RB&W fastener that costs far less to make and assemble.

Chances are you can find a stage in your operations where RB&W "fastener engineering" can help you keep costs in line. As a leading manufacturer of all kinds of fasteners, we're always able to recommend and supply the right ones for all your needs. Write RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



EASIER, FASTER ASSEMBLY undercut high costs when Purolator switched from a two-piece fastener *(right)* to an RB&W-designed cold-formed fastener *(left)* for its famous oil filter.

RB&W

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Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, PITTSBURGH, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

GILBERT T. BOWMAN

O. W. BARNETT

GEORGE A. CUNNINGHAM

. . . Rockwell Mfg. names three to product management posts

charge of branch operations, **Trailmobile Inc.**, Cincinnati, subsidiary of Pullman Inc.

Gilbert T. Bowman, gas and Nordstrom valve products manager, **Rockwell Mfg. Co.**, Pittsburgh, was named to the newly created post of manager, products department, meter and valve division. Succeeding him as Nordstrom valve products manager is **O. W. Barnett**. **George A. Cunningham** was named gas products manager.

Oliver Iron & Steel Corp. appointed **William S. Palmer** sales representative in the Pittsburgh central sales territory for its industrial fasteners division. **Robert J. Freyvogel Jr.** will serve as district sales representative in Michigan.

Col. E. W. Hess was made director of purchases for **United States Hoffman Machinery Corp.'s** plants in Syracuse, N. Y.

Howard I. McCoy will serve as sales engineer in the St. Louis area for Standard Steel Works Division, **Baldwin - Lima - Hamilton Corp.**

Lincoln Thompson, inventor and engineer in the field of electronic and sound recording and formerly of Sound Scriber Corp., has joined **Raymond Engineering Laboratory Inc.**, Middletown, Conn., as a vice president.

Vanadium-Alloys Steel Co., Latrobe, Pa., announces addition of **Dr. John C. Hamaker Jr.** to its metallurgical research department. He was formerly plant metallurgist for General Iron Works Co., division of Stearns-Rogers Mfg. Co.

John S. McElwain will manage **Perfection Stove Co.'s** new commercial and industrial room air conditioner sales division, with headquarters in Cleveland. He was previously sales manager for Cleveland Air Conditioning Corp. and for Avery Products Co.

William J. Westphale Jr. was appointed district sales manager for the new Chicago office of **Fusite Corp.**

Craig T. Capp, former contracting manager, marine department, American Bridge Division, U. S. Steel Corp., was appointed general sales manager of **Ingalls Shipbuilding Corp.'s** barge and towboat division. He will have headquarters at Ingalls' Birmingham executive offices.

William C. Messinger, secretary and assistant to the manager of the construction machinery division of **Chain Belt Co.**, Milwaukee, was elected to the board of directors to fill the vacancy left by resignation of **George D. Gilbert**, president of L. B. McKnight Co.

At the newly established distribution assemblies department of **General Electric Co.** at Plainville, Conn., **R. C. Wilson** was named manager-engineering. **T. D. Mac-Lafferty** manager-marketing, **Charles K. Skinner** manager-manufacturing and **R. J. Blair** manager-finance.

Samuel J. Childs was elected president of **Daystrom Inc.'s** Daystrom Furniture Division, Olean, N. Y. He succeeds **Paul M. Dollard**, who resigned in 1952. **Walter S. Marder** continues as executive vice president.

Mullite Refractories Co., Shelton, Conn., promoted **Edward L. Bohn** to vice president. He joined the firm in 1952 as research consultant on furnace maintenance and construction.

F. Pat Greene was made general sales manager, **Newman Industries (America) Inc.**, with offices in New York. He was with Gardner Denver Co. for 23 years and recently served with Chicago Pneumatic Tool Co.

Jackson & Church Co., Saginaw, Mich., retained **R. Louis Rougemont**, former chief engineer with Reed-Prentice Co., as consulting engineer for its plastics division.

J. K. Sutherland, general manager of **Ford Motor Co.'s** steel division, Dearborn, Mich., was appointed special assistant to S. W. Ostrander, Ford Motor Co. vice president and group executive. **K. D. Cassidy**, formerly general manager, manufacturing services division, succeeds Mr. Sutherland, and is in turn succeeded by **K. E. Scott**. **G. O.**

THERM-O-FLAKE INSULATION

Basic material is exfoliated vermiculite, a non-metallic micaceous mineral with most efficient insulation properties.

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An excellent insulating cement for application to all furnace brick-work exposed to temperatures up to about 2000 F. Sticks tightly to basic, silica or fire clay brick. Provides most efficient insulation with extra large surface coverage.

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Pressed Block with high insulating efficiency and structural strength under temperatures up to 1900 F. Contains diatomaceous silica and a special bond for unique resistance to moisture.

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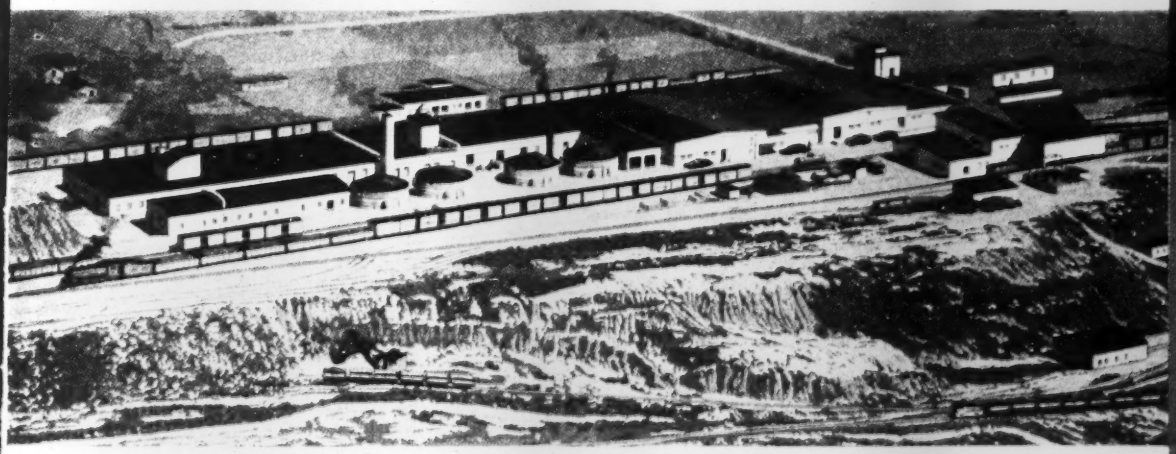

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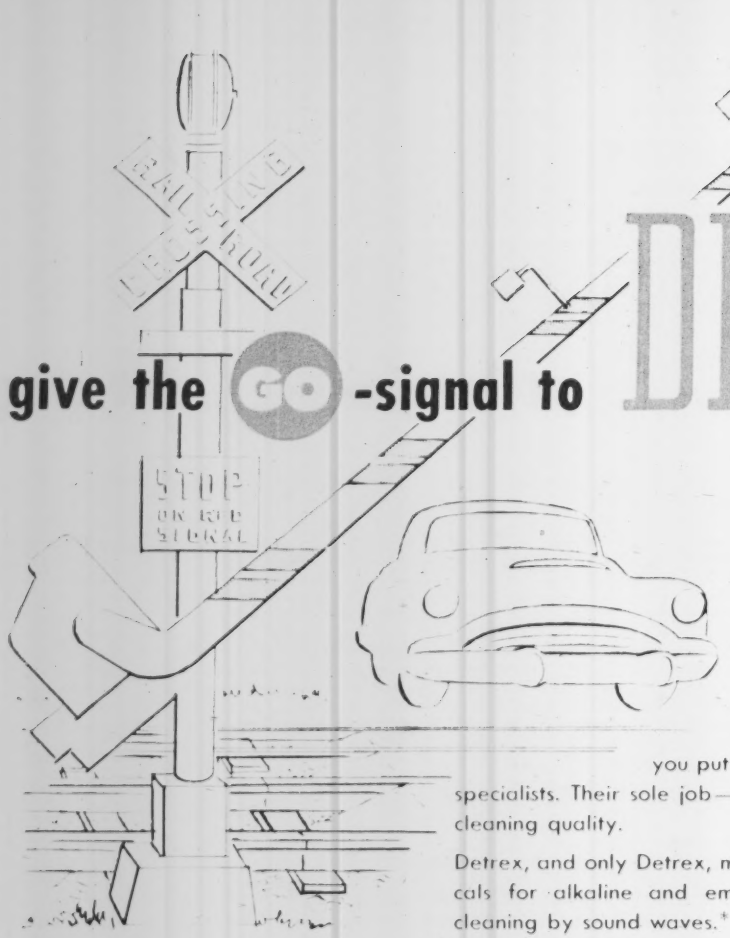
Chemically bonded, Hi-Silica Chem-Brix are superior to many fire clay brick which shrink, deform or spall when subjected to elevated temperature conditions. Develops a protective surface glaze which tightens the joint and lessens slag penetration.

carbon Chem-Brix

Chemically bonded Carbon Chem Brix assure longer service, less skulling loss and negligible spalling. They are fortified with a carbon ingredient which is neutral to molten iron and many slags.



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NEIL POHL
. . . Allis-Chalmers motor grader sales mgr.

RICHARD G. TESSENDORF
. . . Aluminum Industries v. p.

N. R. KIDDER
. . . Jones & Lamson div. manager

Keutgen becomes executive assistant to Mr. Cassidy.

Neil Pohl fills the newly created position of motor grader sales manager, industrial sales department, tractor division, **Allis-Chalmers Mfg. Co.**, Milwaukee. He has been industrial sales manager at the division's Kansas City branch since 1952.

T. V. Learson, sales manager, electric accounting machine division, **International Business Machines Corp.**, New York, was appointed general sales manager of IBM. He is succeeded by **Orland M. Scott. Bruce S. Chandler Jr.** was made district manager with headquarters in Cincinnati, succeeding Mr. Scott.

W. A. MacDonald was elected executive vice president, **Sterling Engine Co.**, Buffalo, a newly created position with the company. Previously vice president-sales, he continues to handle sales duties.

Richard G. Tessendorf was elected a vice president of **Aluminum Industries Inc.**, Cincinnati. He joined the company in 1933 in the time-study department. Advancing through production and sales offices, he was promoted in 1952 from sales manager, manufacturing division, to general works manager of all plant operations.

Acheson Industries Inc., New York, elected **Raymond Szymanowitz** vice president, **P. C. Buck** vice president and **M. W. Reynolds** vice president and **John C. Sprague** secretary-treasurer.

R. M. Smith was promoted to assistant chief engineer, engineering department, at **Caterpillar Tractor Co.'s** Joliet, Ill., plant.

Semet-Solvay Division, Allied Chemical & Dye Corp., appointed **H. Stuart Auvil** director of the new coke research center at its Ashland, Ky., plant.

Jones & Lamson Machine Co., Springfield, Vt., named **N. R. Kidder** manager of its newly established market research and sales analysis division.

Daniel J. Hobbs, personnel manager, was promoted to factory manager, **Huffman Mfg. Co.**, Dayton, O. **Robert R. Huffman** was made sales manager of the mower division.

Maurice Nicholls assumes the duties of manager, New York office, for **Kaiser Engineers**, division of Henry J. Kaiser Co. He transfers from the firm's Oakland, Calif., office, where he had been consulting engineer.

Michael R. Yatsko was named superintendent of industrial relations for **Republic Steel Corp.'s** warehouse division, Youngstown. He succeeds **Gordon J. Mitchell**, now superintendent-industrial relations for the Truscon Steel Division.

OBITUARIES...

James H. King, 61, vice president and a director of **Babcock & Wilcox Co.**, New York, died Nov. 13. He had been head of the boiler division since 1952.

Lester J. Ross, since 1946 president of **Torrington Co.**, Torrington, Conn., died Nov. 14.

H. C. Burrell, 50, director of raw materials development for **United States Steel Corp.** at San Francisco, died Nov. 9 in Pittsburgh of a cerebral hemorrhage.

Frank D. Benson, 62, vice president, **Hewitt Metals Corp.**, Detroit, died Nov. 8.

Lewis D. Spence, 73, a retired executive of **Brown & Sharpe Mfg. Co.**, Providence, R. I., died Nov. 9.

Julian J. Schermerhorn, 77, former president and board chairman, **Joseph Dixon Crucible Co.**, Jersey City, N. J., died Nov. 8.

Millard J. Cover, 58, former executive of **Columbia-Geneva Division**, U. S. Steel Corp., died Nov. 3 in Los Angeles.

John F. Heggie, 73, president, **James G. Heggie Mfg. Co.**, Joliet, Ill., died Nov. 10.

Nils G. Kindwall, 73, president, **Kindwall Bros. & Larson Inc.**, Chicago, died Nov. 5.

Kropp Forge Expands

New facilities will be used to process difficult-to-forge materials, such as titanium

KROPP FORGE CO., Chicago, is undertaking a $5.5-million improvement and expansion program which will enable the firm to produce larger and more complex forgings for Army aircraft parts.

The program includes the construction of a new hammer shop at the Chicago plant to house additional equipment necessary for forging important aircraft components of difficult-to-forge materials, such as titanium, stainless steel and heat resisting alloys. Installations in the hammer shop will include two 50,000-pound drop forge hammers, two 2750-ton presses, heat treating furnaces, rolling equipment, a large hydraulic forging press and other auxiliary equipment.

The new hammers will be the largest to date installed by the company, says Roy A. Kropp, president. At present, the largest in operation is a 40,000-pound drop forge hammer which was installed last year as part of a $4.5-million expansion program.

Widen Research—Increased interest in titanium as an important material for aircraft production has created a demand for larger and more modern forging developments, Mr. Kropp says. The company has been forging titanium for several years in a wide variety of difficult shapes and sizes and is increasing its research and development in this field.

Kropp's engineered products plant in Cicero, Ill., has reached a steady stage of production. The unit was established last year to specialize in semifinishing and finishing of forgings. Machining programs formerly performed at the main plant have been moved to the new building.

Harvill Buys McBain Corp.

Harvill Corp., Los Angeles, producer of diecastings and manufacturer of diecasting machines, purchased McBain Corp., Long Beach, Calif., manufacturer of valves. Kenneth C. McBain, formerly president of the McBain organization, is now its vice president and general manager. Harvill plans to supplement the physical equipment of McBain Corp. so that a much higher level of production will be attained.

Builds Can Plant in Canada

Vulcan Containers Ltd., can producer, is erecting in Toronto, Ont., a factory with 15,000 sq ft of floor space. Production is expected to begin in the near future and will be under the direction of Norman G. Bernecker, president of the firm.

Lamson Buys Mobilift Line

Lamson Corp., Syracuse, N. Y., acquired the fork-lift truck business of Mobilift Corp., Portland, Oreg., and organized Lamson Mobilift Corp. to take title to the assets. By adding fork lift trucks, Lamson extends its line of materials handling equipment which includes belt and roller conveyors, pallet loaders, pneumatic tubes and blowers.

Colonial Broach Co. Expands

Colonial Broach Co., Detroit, is adding 6000 sq ft of floor space at its plant at 21601 Hoover Rd., that city. The firm is celebrating its 35th anniversary this year.

Ringing the Wind

Big around as a ferris wheel are these stainless steel expansion joints which will be installed in a National Advisory Committee for Aeronautics supersonic wind tunnel in Cleveland. Largest is 28 ft in diameter. They were fabricated by Solar Aircraft Co., San Diego, Calif., and shipped by water

Fabricating Firm Organized

John Dale (Canada) Ltd. established manufacturing operations in Toronto, Ont., and will begin the production of metal containers and sheet metal products early in 1954. The company is a joint subsidiary of John Dale Ltd., London, England, and Modern Containers Ltd., Toronto.

Bearings Firms To Unite

Subject to approval by stockholders, Federal-Mogul Corp., Detroit, will consolidate with Bearings Co. of America, Lancaster, Pa. Both firms are manufacturers of ball bearings and other allied products.

Koppers Extends Service

Koppers Co. Inc., Pittsburgh, purchased American Ore Reclamation Co., Chicago, builder of sintering machines and plants. The company has been credited with many outstanding contributions to the technology of iron ore agglomeration. Sintering activities formerly carried on by American Ore Reclamation will be conducted by Freyn Department of Koppers Engineering & Construction Division.

Clarke Moves Branch Office

Clarke Sanding Machine Co., Muskegon, Mich., moved its central New York branch from Utica to 2001 Teall Ave., Syracuse. The company purchased the Sanding Machine Division of Porter-Cable Machine Co., Syracuse, in January, 1952. Charles H. Hasper, division manager, will be in charge of the Syracuse branch.

Barrows Heads Enamel Group

W. A. Barrows of Barrows Porcelain Enamel Co., Cincinnati, was re-elected president, Porcelain Enamel Institute, Washington. Vice presidents are: W. N. Noble, Ferro Corp., Cleveland; J. E. Bourland, Texlite Inc., Dallas; E. O. Brady, Briggs Mfg. Co., Detroit; R. C. Myers, U. S. Steel Corp., Pittsburgh; H. McE. Patton, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; R. N. Smith, Temco Inc., Nashville, Tenn. P. B. McBride, Porcelain

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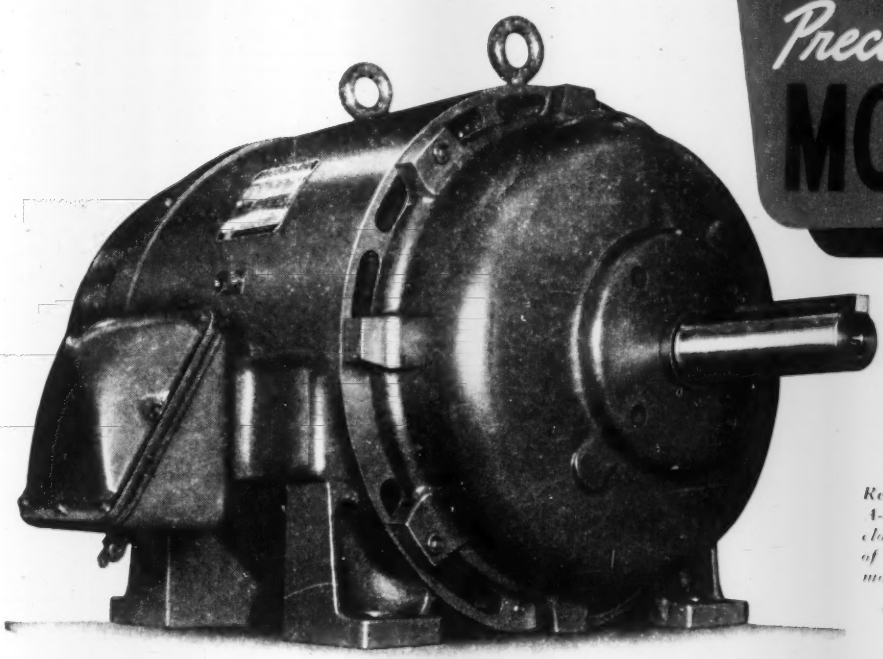
"All motors are NOT alike!"

RELIANCE
Precision-Built
MOTORS



Reliance Totally-enclosed Fan-cooled A-c. Motor. All other standard enclosures available, with wide choice of mechanical designs and special mountings. Ratings from ¾ to 500 hp.

- ☆ Heavy shafts, bearing to bearing
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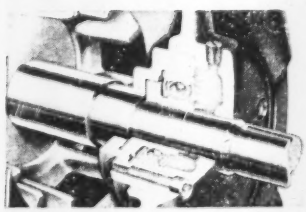
- ☆ Shock-resistant frame and bearing-bracket construction



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The Reliance pre-lubricated bearing provides *four times more operating hours without re-lubrication* than any other bearing used in motors today. And—whatever your lubrication schedule—*you just can't grease 'em wrong!* To get the complete "inside story" on motor bearings, write today for Bulletin B-2201. It contains hard facts on the advantages of the Reliance pre-lubricated bearing design, with cutaway view, cross-section diagram, comparison chart, and statements by bearing manufacturers. Write

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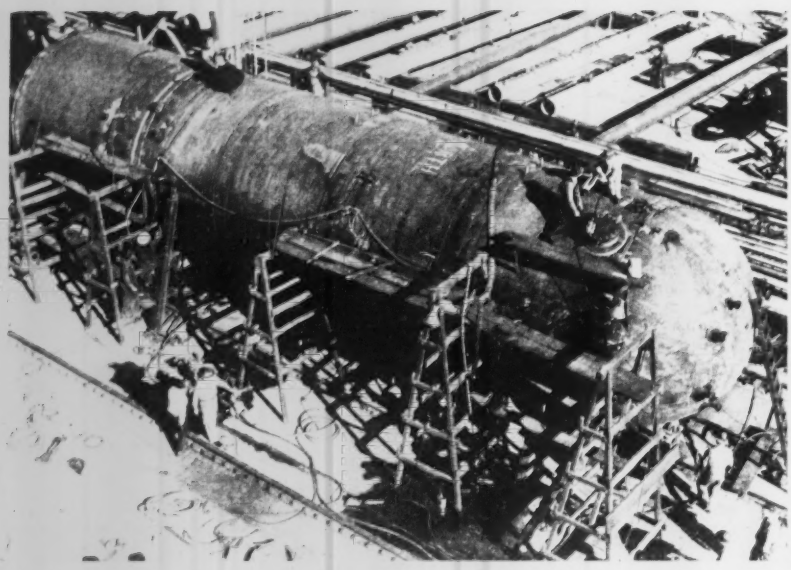


A Giant Test Tube for Phenol

Undergoing hydrostatic tests at Bethlehem Pacific Coast Steel Corp.'s shipyard in San Francisco is this 85-ton oxidizing process vessel. It is to be used as a basic unit in the manufacture of phenol at Standard Oil Co.'s refinery in Richmond, Calif. It is 65 ft long and has an inside diameter of 14 ft. The vessel was fabricated from stainless steel-clad plates, 10 ft x 24 ft with a plate thickness of 15 16 in. and a stainless steel cladding thickness of 1 16 in.

Metals Corp., Louisville, was re-elected treasurer; Edward Mackasek, managing director; and John C. Oliver, secretary.

Rockwell Buys Canadian Firm

Rockwell Mfg. Co., Pittsburgh, purchased Callander Foundry & Mfg. Co. Ltd., Guelph, Ont., manufacturer of power tools and electrical conduit fittings. W. W. Brydges is president of the Canadian firm which will be operated under its present name as a wholly owned subsidary of Rockwell.

Quaker Establishes Branch

Quaker Rubber Corp., a division of H. K. Porter Co. Inc., Philadelphia, established a warehouse and sales office at 4384 E. Bandini Blvd., Los Angeles. The branch is under the supervision of James Joyner.

Westinghouse Appoints Agent

Westinghouse Electric Corp., Pittsburgh, appointed Pacific Metals Co. Ltd., San Francisco, as its welding distributor in California, Nevada, Utah, Arizona and southern Idaho.

Ardcor Completes New Plant

American Roller Die Corp. completed its new plant and offices at 29501 Clayton, Wickliffe, O. The firm's plant capacity is increased substantially for production of roll forming machines; tubing mills; forming and tubing rolls; and straightening, pinch and leveller rolls. Harry J. Eisenman is president; Robert Akers, vice president and secretary.

Steel Co. Moves Sales Office

Steel Co. of Canada Ltd., Toronto, Ont., moved its district sales office to 600 University Ave., that city. A. R. McMurrich is the district sales manager.

W-P Equipment Corp. Formed

W-P Equipment Corp., Buffalo, a new company, purchased certain assets, including inventory and designs, of Pressed Steel Car Co.'s Rice & Adams Equipment Division, Tonawanda, N. Y. Howard P. Faust is president of the new company. He also is president of R. G. Wright Co. Inc., dairy and industrial machinery manufacturer, Buffalo. Rice & Adams machinery and other assets will be sold at public auction.

Liquidates Scranton Pump

Scranton Pump Division, Condenser Service & Engineering Co. Inc., Scranton, Pa., is being liquidated by Consolidated Products Co. Inc., New York City, which recently acquired Condenser Service. The Scranton operation is being moved to Hoboken, N. J., where all Condenser plants will be consolidated.

Haines Heads Distributors

National Association of Sheet Metal Distributors, Philadelphia, elected the following officers: President, Lee J. Haines, E. E. Souther Iron Co., St. Louis; vice presidents, W. H. Bowe Jr. of Herrick Co., Boston, and Roger K. Becker of Ohio Valley Hardware & Roofing Co., Evansville, Ind. W. J. Busser Jr. of Busser Supply Co., Lewisburg, Pa., and A. B. Lewis of Palmer-Donavin Mfg. Co., Columbus, O., were selected members of the executive committee.

Commercial Induction Expands

Commercial Induction Heating Co., Dayton, O., purchased Associated Spring Corp.'s building in that city. The latter company moved to a larger building. Commercial Induction will install additional equipment to double capacity at its new plant.

Midwest Firms Merge

Allis-Chalmers Mfg. Co., Milwaukee, officially assumed operation of Buda Co., Harvey, Ill., on Nov. 1. Buda Co., manufacturer of railroad supplies of all kinds, earth boring machines, diesel and gasoline engines, fork-lift trucks, industrial plant trucks, lifting jacks and maintenance-of-way equipment, is being operated as a division of Allis-Chalmers.

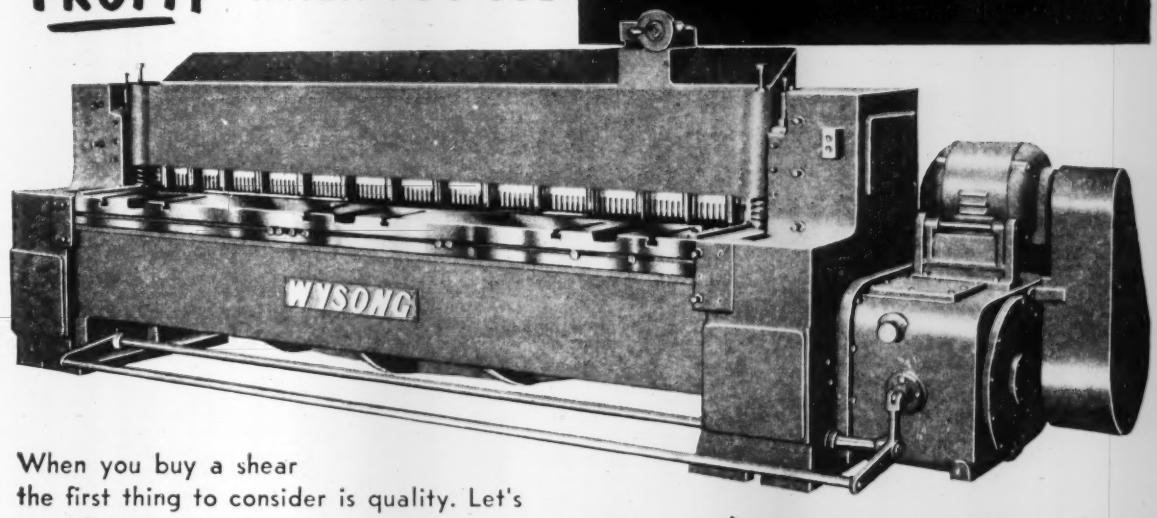
Ralph K. Mangan retains the title of president and is general manager in charge of the division. The two Buda plants, including more than 25 buildings, contain 654,146 sq ft of floor space. With

(*Please Turn to Page 77*)

SAVE WHEN YOU BUY

PROFIT WHEN YOU USE

A WYSONG



When you buy a shear
the first thing to consider is quality. Let's
consider what you get when you buy a

WYSONG 1/4" CAPACITY SHEAR

For instance there isn't a quieter or more trouble-free holddown on any shear made.

Fine. But just how much pressure does it provide?

Up to 10,000 pounds, but pressure is easily decreased to prevent marring of sheets.

Can I cut thin sheets and ¼" plate at the same time?

Certainly. That is a matter of blade setting and equalized holddown. Compensating springs in each holddown foot equalize the pressure on materials of different thicknesses and irregular sheets. The blade setting for ¼" gives a good cut on thin sheets.

Do I have to open the gear box to set non-repeat unit?

No. Merely turn knob at front of gear box to "C" for continuous operation or to "S" for single-stroke.

How often must I grease gears and eccentrics?

Those parts and the clutch run in baths of oil. Oil in the gear box should be changed every six months and in the end frames about once a year.

Well, I see it is safe and easy to operate, but does it hold accuracy under the heavy load required to shear full length ¼" sheets?

As close as any shear made. The rigid, massive, Hi-tensile casting construction of Wysong Shears has made them known for maintaining alignment.

Do I have to buy the motor and starter as extras?

No. Wysong furnishes them, mounted and wired for operation.

How much extra does the front-operated back gauge cost?

Not a cent . . . it's standard equipment. The price also includes solid, four-edge blades, a nine-jaw clutch with non-repeat unit, metal finger guard and belt guards.

NATIONAL MACHINE TOOL BUILDERS ASSN. MT MEMBER

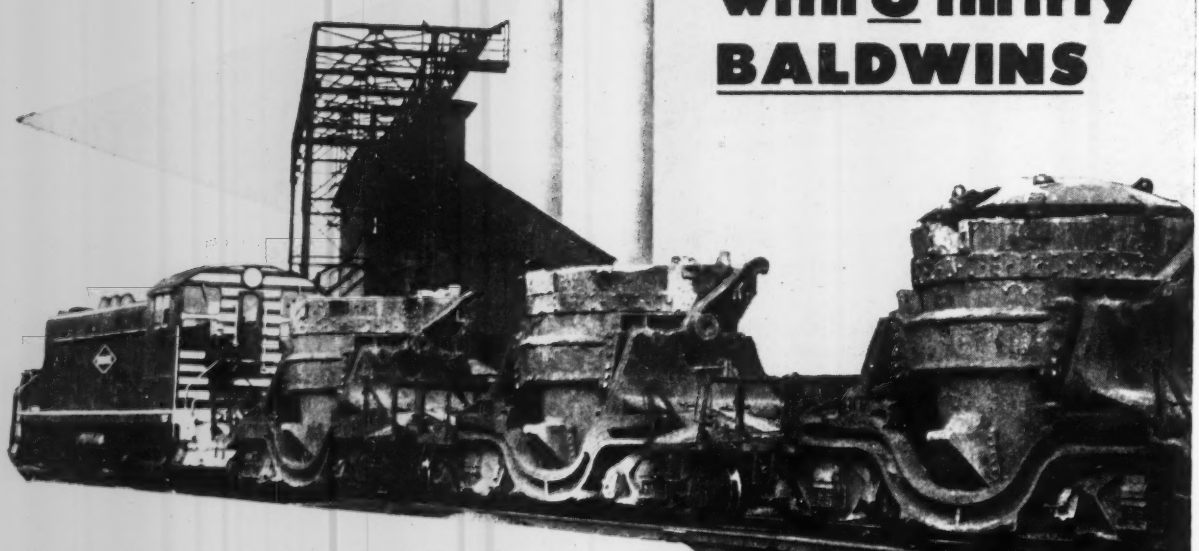
For better quality and greater value join the many satisfied users who say . . . "for Shear satisfaction . . . buy a WYSONG . . . it's MILES ahead". See your dealer or write to factory.

WYSONG

WYSONG & MILES COMPANY

GREENSBORO, NORTH CAROLINA

SHARONSTEEL reduces operating costs with 6 thrifty BALDWINS



The use of six continuously operating Baldwin-Westinghouse diesel switching locomotives by the Sharon Steel Corporation at their Roemer Works reduced operating costs. Here is Sharon Steel's report:

"We have found that operating costs are lower with the Baldwin-Westinghouse diesels than they were with steam locomotives.

"There is a reduction in operating delay at each turn change time, because refueling and resanding is done only once every three days. Formerly, we took on water, coal, sand and cleaned the fires at each turn change.

"The installation of diesel locomotives has been a large step forward in our air purification program. The elimination of smoke and dirt produced by the steam locomotives entering buildings has greatly improved working conditions. Another improved feature over steam locomotives is the ability of the Baldwin diesel to rapidly generate more air pressure for our air dumped cars."

If *you* are interested in cutting *your* operating costs, write now for Bulletin DMH-300, to Dept. 1646, Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.

BALDWIN · BLH · LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON

INDUSTRIAL LOCOMOTIVES

...they're thrifty!

(*Continued from Page 74*)

this new division, Allis-Chalmers operates 16 factories, including 12 in the United States, two in Canada and two in England.

Opens Cutting Tool Warehouse

United Drill & Tool Corp.'s Whitman & Barnes Division, Plymouth, Mich., opened a warehouse at 1851 Cheshire Bridge Rd., Atlanta. A large stock of cutting tools will be carried.

Aluminum Group Changes Name

Aluminum Research Institute, Chicago, changed its name to Aluminum Smelters Research Institute. Officers are: C. V. Cooper, Wm. F. Jobbins Inc., Aurora, Ill., president; E. A. Bergman, U. S. Reduction Co., East Chicago, Ind., vice president; Allan Nichamin, American Smelting & Refining Co.'s Federated Metals Division, Detroit, treasurer; Carl H. Burton, secretary.

National Radiator Expands

National Radiator Co., Johnstown, Pa., has launched an expansion program. A new rotary kiln is being installed which will result in a considerable increase in iron powder production. The kiln is about twice as big as comparable equipment now in use.

Kennametal Completes Project

Kennametal Inc., Latrobe, Pa., producer of tungsten and titanium carbide products and specialties, completed a new shop building at its plant in that city. The facility will be used to increase manufacturing space and to house Kennametal's special tool, mechanical development, diemaking, grinding, inspection, shipping, salvage and finished stock inventory departments.

Anker-Holth Names Agent

Wellman Engineering Co.'s Anker-Holth Division, Port Huron, Mich., manufacturer of air and hydraulic cylinders, chucks, collets and air valves, appointed Paddon Co., Youngstown, as its representative in that territory.

Washington Iron Works To Move

Washington Iron Works, manufacturer of logging machinery, mining equipment and other heavy industrial machines, plans to move its plant to a tract in the Sammamish valley, some distance outside of Seattle.

American Flange Buys Firm

Sale of Wilson Mfg. Co., Niles, O., to American Flange & Mfg. Co., New York, has been announced by Walter A. McClelland, president of the Niles concern. Mr. McClelland will continue as manager of the plant. American Flange & Mfg. will expand production of closure fittings for drums and will make new items at Niles. Wilson Mfg. has been making closure fittings, hot-strip stampings and brass fixtures.

Leschen Forms Sales District

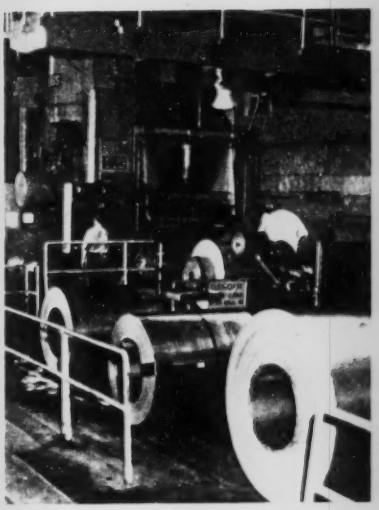
Leschen Wire Rope Division, H. K. Porter Co. Inc., St. Louis, established a sales district covering Texas, Louisiana and Oklahoma. F. E. Suder is district manager with headquarters in Houston.

Fan Manufacturers Reorganize

Power Fan Manufacturers' Association was organized with headquarters at 2159 Guardian Bldg., Detroit. Formerly the Propeller Fan Manufacturers' Association, the organization is a consolidation with a group of 12 power roof ventilator manufacturers. The group's primary purpose is to establish accurate delivery ratings so that the public may purchase with confidence. Other aims are the perfection of fan engineering, application to user's problems and to develop markets.

GE Forms Four Departments

General Electric Co., Schenectady, N. Y., discontinued its fractional horsepower motor department and established four new ones to take over its operations. The new departments and their managers are: general purpose components motor department, Lisle D. Hodell; hermetic motor department, Ab Martin; appliance motor department, Carl W. Moeller; and specialty component motor department, Jack J. Clarkson. All managers have their headquarters in Ft. Wayne, Ind., except Mr. Moeller who is located in DeKalb, Ill.



Mill for the Rouge

Included in equipment for modernizing Ford Motor Co.'s Rouge Plant in Dearborn, Mich., is this new four-high temper mill built by E. W. Bliss Co., Salem, O. Bliss is also furnishing mandrel-type coilers and auxiliary equipment for the 66-inch hot strip mill

Victor Buys Adams Alloy Co.

Victor Equipment Co., San Francisco, purchased Adams Alloy Co., Wakita, Okla., manufacturer of hard facing alloy cast rods.

American Sterilizer Expands

Building program of American Sterilizer Co., Erie, Pa., now under way with the construction of a big assembly plant, is being expanded. The company plans to add an experimental laboratory to the factory building and to construct a power house and foundry. The new projects, with a total square footage of 55,160, will cost $105,500.

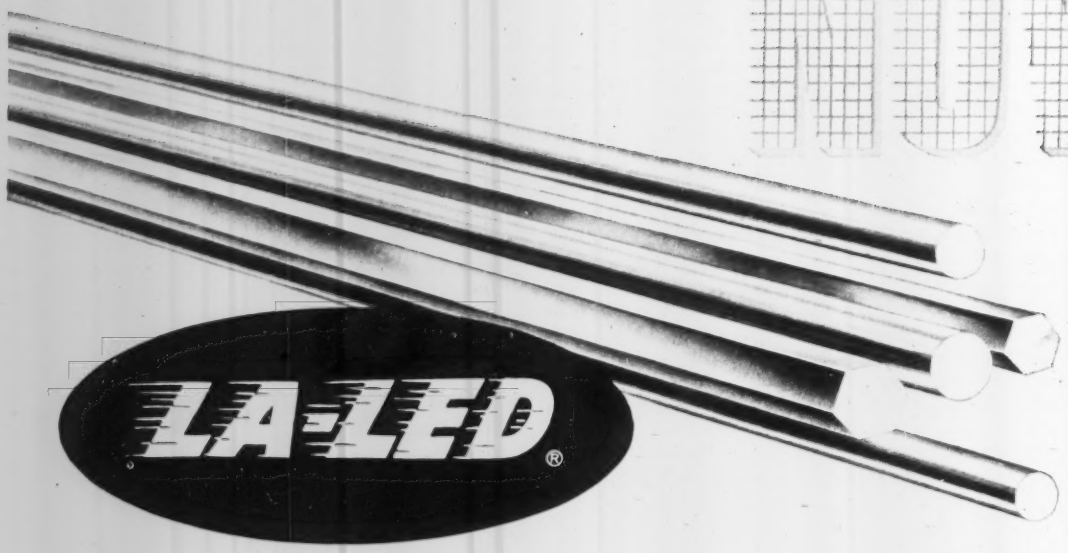
Suggests Tap Designation

Heli-Coil Corp., Danbury, Conn., manufacturer of screw thread inserts, recommends use of the symbol "STI" to all manufacturers as the proper designation of taps

(*Please Turn to Page 80*)

THESE 3 FREE-MACHINING ...COLD-FINISHED

LEADED NOW



LA-LED®

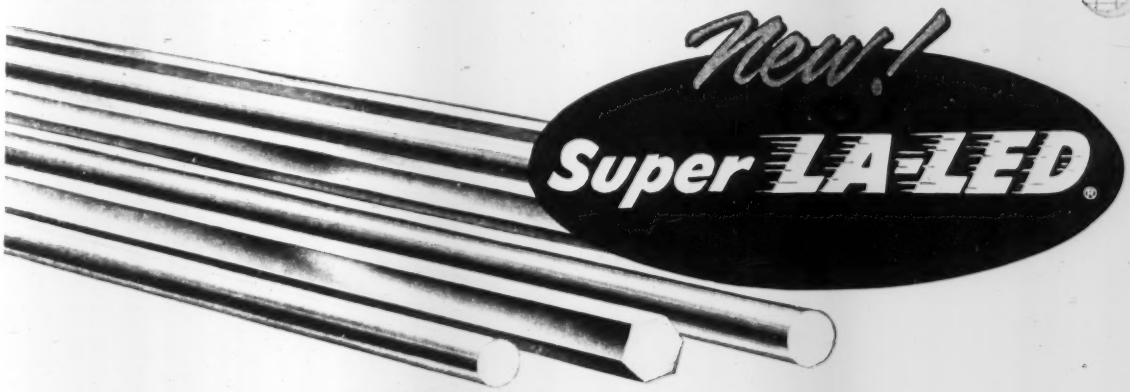
MACHINES 45% FASTER THAN B1113

At last you can switch over to LA-LED lead-bearing, free-machining steel bars for additional applications. This faster machining LaSalle steel cuts your parts cost and also improves your product. And because it is an open-hearth steel, LaSalle LA-LED has the added qualities of ductility, fine finish, and satisfactory carburizing. It maintains close dimensional accuracy, and can be crimped, riveted, staked, and cold worked. Available in rounds $\frac{5}{16}$" through 3", and hexagons $\frac{5}{16}$" through 1½".

La Salle STEEL COMPANY

Manufacturers of the Most Complete Line of Cold-Finished Carbon and Alloy Steel Bars in America!

STEEL BARS AVAILABLE!



ACTUALLY REPLACES BRASS!

MACHINES 80% FASTER THAN ORDINARY SCREW STOCKS

New!
LEADED ALLOYS
.20 Carbon—.40 Carbon

ALL THE PROPERTIES OF ALLOY BARS PLUS GREATER MACHINABILITY!

Now you can get both Leaded 8620 and Leaded 1140 cold finished steel bars. Being leaded, they machine one-third faster! Heat treating characteristics, hardenability, and mechanical properties are not appreciably affected by the addition of lead.

Here is the fastest machining steel ever commercially developed—Super LA-LED. Its exceptional machinability permits its use for those parts which previously could be machined economically only from brass. Since machine capacities so often limit the daily production of brass parts, you can now use Super LA-LED and obtain production approaching that of brass—and drastically cut the part cost.

Send for these Bulletins

LA SALLE STEEL COMPANY
1414 150th Street
Hammond, Indiana

Please send me the following La Salle Helpful Data Bulletins:

☐ LA-LED #9 ☐ Super LA-LED #12 ☐ LEADED ALLOYS #14

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

(Continued from Page 77)
which provide threads to receive Heli-Coil inserts.

Budd Offers Aluminum Wheels

The Budd Co., Philadelphia, has added aluminum disc wheels to its line of steel wheels which it sells to the trucking industry. The wheels are forged for Budd at Aluminum Co. of America's Cleveland Works on a 3000-ton press. Budd then has the forgings machined to close tolerances.

Association Elects Officers

Foundry Equipment Manufacturers Association, Cleveland, elected as its officers: President, W. B. Wallis, president of Pittsburgh Lectromelt Furnace Corp., Pittsburgh; vice president, D. E. Davidson, vice president for sales, Link-Belt Co., Chicago; Arthur J. Tuscany Jr. was elected executive secretary-treasurer of the organization, succeeding his father, the late Arthur J. Tuscany, who had served FEMA in a similar capacity for 18 years.

Milne Moves Chicago Office

A. Milne & Co., New York, distributor of solid and hollow tool steels, moved its Chicago office and warehouse to larger quarters at 2080 N. Hawthorne Ave., Melrose Park, Ill. H. S. Hoyt Jr. is branch manager.

Solar Steel Boosts Sales

New Cincinnati facility will play important role in firm's aggressive merchandising

SOLAR STEEL CORP., Cleveland, expects its new Cincinnati warehouse, which was opened formally Nov. 9 (STEEL, Oct. 26, p. 110) to play an increasingly important part in the company's operations.

For example, its former warehouse in that district sold 7987 tons of steel in the 1952-53 fiscal year, but in the 1953-54 fiscal year the new facility has a target of 20,520 tons. In alloy bars, the target is 1800 tons compared with 815 tons in 1952-53; in cold-finished carbon bars, 6000 tons against 3502.

The over-all outlook of the company in regards to 1953-54 is one of increased tonnages. Estimated shipments of products sold by Solar in 1952-53 and the targets for 1953-54 are shown in the following table:

	Tons Shipped 1952-53	% of Total for Warehouse Industry	Target (Tons) 1953-54
Flat Rolled	80,861	2.2	118,800
Carbon Bars H.R.	1,453	0.1	2,700
Carbon Bars C.F.	15,014	2.9	40,260
Alloy Bars	7,578	3.8	14,100
Tubing	220	0.07	1,800
Grand Total	104,946	1.74	178,476

The firm's Cleveland warehouse is expected to increase its sales of cold-finished carbon bars from 4349 tons in 1952-53 to 10,800 tons in 1953-54. The total tonnage for Cleveland in 1952-53 was 7339 tons compared with a target of 17,520 tons in 1953-54. The Detroit warehouse is expected to increase its tonnage from 25,470 tons in 1952-53 to 35,460 tons in 1953-54. Its other numerous warehouses also have higher goals for the current fiscal year.

Sol H. Friedman, president, says that operation of its own mill is not in Solar's plans at this time. The bar and tube divisions are going to be expanded. Leaded steels and alloys may be added to the line.

Dolan Steel Expands

Dolan Steel Co. Inc., has constructed an addition to its plant at Bridgeport, Conn. This sheet and strip warehousing firm has facilities for slitting, decoiling and leveling coils up to 15,000 lb and for shearing strip and blanks to exact specifications.

Rynel Engineers are Airborne

Rynel Corp., Sterling, Ill., gear manufacturer, is using a fleet of five aircraft to service customer accounts on a nationwide basis with a minimum sales staff. Daily trips are made from the firm's headquarters to Buffalo, Detroit, St. Louis and Dallas, while an average of three round trips daily are made to the Chicago sales office. Rynel aircraft carry its salesmen and engineers to customers' plants and pick up officials and engineers at customers' plants for trips to Sterling.

LOUIS POLK
. . . Sheffield Corp.

JOHN C. COTNER
Hydraulic Press Mfg. Co.

WILLIAM E. RUTZ
G & L Machine Tool Co.

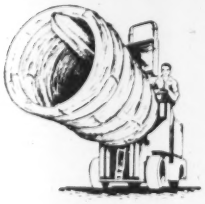
EVERETT M. HICKS
. . . Norton Co.

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION, Cleveland, has elected Mr. Polk second vice president and Mr. Cotner treasurer. H. L. Tigges (STEEL, Nov. 16, p. 71) was elected president; M. A. Hollengreen, first vice president. New directors are Messrs. Polk, Hicks and Rutz. Tell Berna is again general manager; F. F. Selbert, secretary

For industrial trucks . . . Exide-Ironclad now offers

★ 20% more capacity in the same space

★ Lowest cost per A.H. to own and operate



This cutaway picture shows the inside of the new T H EXIDE-IRONCLAD Battery.

Its larger positive plates, containing corrosion-resistant Silvium, are different . . . unique . . . exclusive! No other type of positive plate construction offers you the advantages of the T H Exide-Ironclad, with its slotted plastic tubes, permanently sealed on the bottom with polyethylene tube sealer. More active material is exposed to the electrolyte, resulting in greater power. More active material is retained, providing higher battery capacity for a longer working life. Other features include improved negative plates . . . practically indestructible Pormax separators . . . new sealing compound . . . shockproof molded jar . . . unbreakable quarter-turn vent plugs of plastic . . . corrosion-resistant tray coating.

All of the features of the new T H Exide-Ironclad Battery construction provide direct operating-hour savings for you.

Now-more than ever before...
YOUR BEST POWER BUY AT ANY PRICE!

1888... DEPENDABLE BATTERIES FOR 65 YEARS...1953

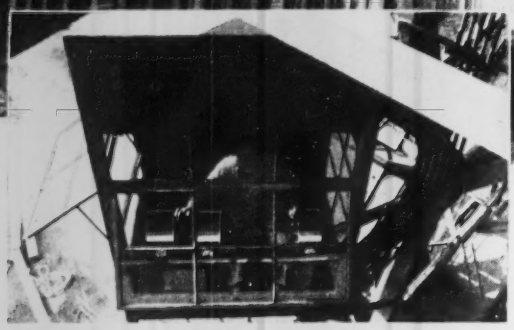
The new T H Exide-Ironclad BATTERY

Thrifty Hauler

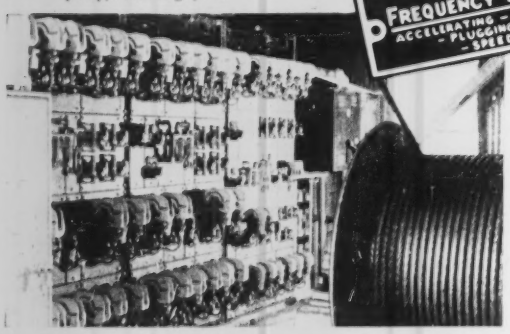
THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 2 • *Exide Batteries of Canada, Limited, Toronto*

"EXIDE", "EXIDE-IRONCLAD", "SILVIUM", "PORMAX", Reg. U.S. Pat. Off.

Fast Lifts–Safe Lifts WITH EC&M CONTROL easy to operate, TOO



Narrow-width EC&M Cam Master Switches are closely grouped for operator's convenience on this 720 ton-per-hour Barge Unloader, designed, fabricated and erected by Heyl & Patterson for the Duquesne Slag Company, Pittsburgh, Pa.



EC&M LINE-ARC Contactor Controllers for Closing & Holding Line Motors and for the Trolley Motion are EC&M Frequency Relay Controlled for fast, safe operation.

Output increases and costs go down when operators find rhythmic response at their finger-tips. Paying out cable to dig into the pile, taking the swing out of a loaded bucket at the point of discharge, and keeping the bucket open when lowering for another load are time-savers on bulk material-handling applications.

On river unloading stations, at lake and ocean ports, EC&M Control has a reputation among operating management for fast handling because bucket manipulation, trolley travel and similar operations respond quickly to the operator's needs. Straight-line, lever-operated EC&M Cam Master Switches have a short throw in both directions—are less tiring on the operator—the off-point is distinct and easy to find when returning from any of the speed-points. Put your control applications up to EC&M.

It pays to specify **EC&M Control—**
control engineered for high output with safety.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Technical Outlook

November 23, 1953

TEAMWORK IN SCRAP—By encouraging scrap dealers to visit steel plants and sending company representatives to dealers' yards, Columbia-Geneva Division, USS, has worked out a highly successful program of scrap improvement. Fewer poorly prepared bundles, fewer impurities, and better sizing of individual pieces by scrap dealers have increased open hearth tonnages. Bundles take less time to handle. For their part, companies have made changes in selecting scrap for specific heats, segregating material into higher and lower quality for different steel requirements.

CUTS CAP COSTS— Protective cloth caps had an expensive mortality rate of 15,000 a year at a large eastern chemical plant. Then management switched to a disposable cap made of neoprene-treated paper. Reported saving: Over 30 per cent annually.

SOME HEADWAY— Titanium and stainless steels have been two of the tough customers in the grinding field. Now, reasonable progress is being made with titanium by running grinding wheels at 40 per cent of normal speed. Result: Faster stock removal, but finishes don't always come up to par. Problems with stainless are about the same, Fred A. Upper, manager, Production Engineering Division, Carborundum Co., Niagara Falls, N. Y., told a recent symposium in Los Angeles.

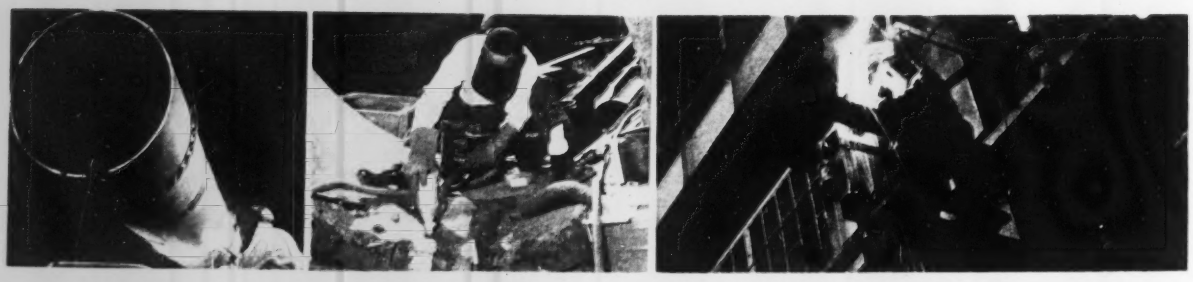
SEALING IN FIRES— Once it was found that roof construction contributed to rapid spread of recent General Motors and Ford fires, rush was on to seek out an acceptable revised construction. Under scrutiny of fire underwriters and construction executives, one answer was demonstrated last week. Lexsuco Corp., Cleveland, eliminates conventional vapor seal of felt plies mopped with tar or pitch in favor of a vinyl liner sheet that will not support combustion. Firm also uses simple one-piece steel clip to secure insulation to steel decks, doing away with asphalt mopping. At 1600° F, a 6 x 18- foot conventional roof sprayed flaming tar over fire, then buckled after about 9 minutes. Under similar conditions, Lexsuco's construction contributed nothing to fire's spread, sagged a bit, but remained intact. One conclusion: Ford's reported blanket repudiation of vapor liners may be too extreme.

SCREWSTICKS— Picture a number of screws attached end to end, and there you have it. Stick is loaded into pneumatic, electric, spiral or hand-ratchet driver. When screw is drawn up snug, it breaks away from its neighbor, which is then in place for the next operation. Available in diameters 0 to 4 (mild steel, brass and aluminum), it's a product of American Screw Co., Providence, R. I.

ELECTRONIC TROUBLESHOOTER— Three probes for trouble location, a tuned r-f probe, audio probe and noise component probe have been built into an experimental model of a bench-type electronic signal tracer at the Naval Research Laboratory. Instrument is designed for quick maintenance of military electronic equipment.

BEARS WATCHING—Research indicates that foundrymen will find magnesium alloys containing thorium easier to handle than rare earth alloys. Presence of thorium makes alloying with zirconium easier and gives higher zirconium recoveries. Dominion Magnesium Ltd., Haley, Ont., is working with two experimental, magnesium-base alloys. One, designed for creep resistance, contains 3 per cent thorium, 2.3 per cent zinc and 0.7 per cent zirconium; other, for high strength at ambient temperatures, has 5.8 per cent zinc, 1.9 per cent thorium and 0.7 per cent zirconium. Both show excellent welding characteristics. Method: Shielded arc welders with $\frac{1}{8}$-inch diameter rod of parent metal composition.

Metalworking Outlook p. 35 Market Outlook p. 127



Pick The Right Arc Welding Method

By THOMAS F. HRUBY
Associate Editor

Welding experts agree that progress in the art has outstepped full utilization by industry. Situation can't last for long in a tightening economy

GIVEN the job of joining two pieces of steel, a blacksmith was put into a room full of the latest kinds and types of welding equipment. After examining each with wonderment, he returned to his hand forge and anvil with the comment, "I better stick to the tools I'm familiar with." And he did, hammering out a pretty fine looking weld.

In a sense, many production planners of today are like our blacksmith. They are aware of the various welding techniques but favor the one or two methods that have done the job well in the past.

Two Reasons—There are actually two chief reasons for the growing number of welding machines and methods today. The first one is obvious. The art has progressed to the point where very nearly all metals and alloys can be welded. In taking these strides, various welding methods have naturally evolved.

Reason number two is not so obvious but it is perhaps more significant than the first. Concept of the welding function itself has undergone a fundamental change, again thanks to progress. Welding has finally shaken off the stigma of its youth—when it was considered only a repair and maintenance tool until now it has moved into practically every industry as a front-line production joining method.

Can't Afford It — Considering that, after machining and cutting, the next biggest lump of the production dollar goes into joining of parts and components, industry can't afford to use anything but the best method. This has always been a production axiom, but the pressures on an increasingly competitive economy accentuate the need.

How to choose the right welding method? Books have been written on the subject, so any attempt to quickly appraise all welding methods and equipment is next to impossible. Only the largest and most versatile segment of the art — electric arc welding — will be treated in these pages, and only to the point of answering the broader application questions.

How It Started—It's not too difficult to understand why the biggest volume of welding today is done with the electric arc. The instantaneous and localized melting heat of a high current density (amperage) spark must have intrigued the first man who drew an arc with a carbon electrode some sixty odd years ago.

First attempts at welding with this arc were limited to light gage metals which were fused together by puddling the molten metal. Since this method wouldn't work with heavier sections, someone tried replacing the carbon electrode with a stick of metal which then supplied both arc for fusion and filler metal for the weld. This broadened the field of application but still left much to be desired in weld appearance and strength.

Arc welding was destined to play its role in maintenance shops, keeping expensive mill equipment and machinery in operation, until the coated electrode arrived on the scene in the late 1920's. Here was the same principle but this time, instead of exposing the weld

Recommended Processes Based on Joint Design

	BUTT JOINT		LAP JOINT		FILLER JOINT		EDGE JOINT		
Welding process	Light* Section	Heavy Section	Light Section	Heavy Section	Light Section	Heavy Section	Light Section	Heavy Section	Overlay Welding
Shielded metal-arc (coated electrode)	S	R	R	R	R	R	NR	R	R
Submerged-arc	S	R	S	R	S	R	NR	S	R
Inert-gas tungsten-arc	R	S	R	S	R	S	R	S	R
Inert-gas metal-arc	NR	R	NR	R	NR	R	NR	S	R

*Light section, 0.005 to 1/2 in. Heavy section, 1/2 in. and over. R recommended, S satisfactory, NR not recommended, NA not applicable.

From paper prepared by John J. Chyle, A. O. Smith Corp., Milwaukee

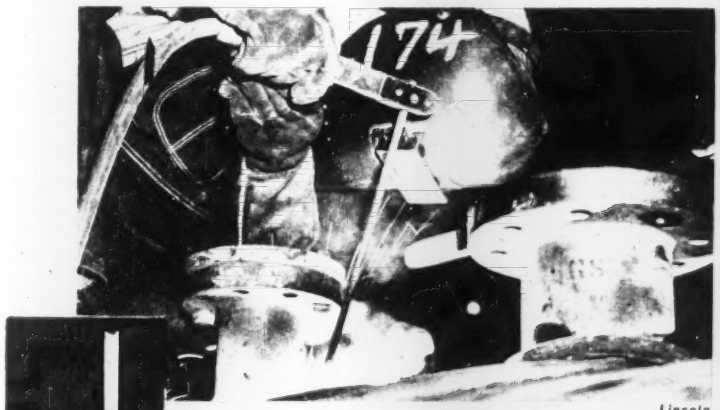
area to rapid oxidation of the atmosphere, the molten flux coating on the rod floated on top of the weld area to give an effective reducing shield. This shielding idea, later to be joined by dry granular type and monatomic gases (hydrogen, helium and argon), was really the door-opener for arc welding as we know it today.

Basic Breakdown—The four major types of arc welding to be discussed differ only in three basic considerations—type of electrode, type of shielding, and addition of filler metal. For instance, welding with the coated electrode involves metallic arc, fused siliceous flux shielding and deposit of filler metal.

Submerged arc welding is done with metallic arc, but with granular flux supplied external to the arc, and a very rapid and even deposition of filler metal.

The other two major arc types have a shielding method in common, helium or argon gas flowed over the arc to the exclusion of oxygen and nitrogen in the atmosphere. However, one uses a so-called nonconsumable tungsten electrode either with or without filler metal; and the other, a continuously-fed wired electrode which supplies both heat source and filler metal.

Each of the foregoing types falls into its own place in the over-all welding picture. Picking the right one for a particular job, however, is complicated by economies and also by rather wide areas of overlap between various methods.



Lincoln

Coated Electrodes

By far the greatest volume of welding is done with this method. It's flexible in application, takes only a normal amount of operator skill and requires the lowest capital investment. For these reasons, in spite of some advances being made by some of the other techniques, shielded-metal arc (coated electrode) welding should remain in the top spot for some time.

Equipment Needed — Something in the neighborhood of $1000 is all it takes to set yourself up with a shielded-metal arc rig. Most of that sum goes for the power unit itself, the remainder being spent on cable and electrode holders. Electrodes themselves come in a variety of sizes; usual length is 14 or 18 inches. Metallurgical properties of both rod metal and flux coating vary with the work, and electrode manufacturers make the various types and are equipped to advise you on specific applications.

Since all arc welding processes are built around a power unit, it might be well to consider, at this point, the question of "ac or dc?" Any discussion on this choice is controversial. Popularity of ac sets has been on the upswing. They practically eliminate arc blow and their static transformers can be equipped with capacitors for improved power factor. DC machines, however, are generally favored among users, especially since the introduction of efficient selenium rectifiers for ac conversion. Further they are more portable and can operate with a wider variety of metals and alloys. As in the case of electrodes, it's best to choose a machine with the counsel of an equipment builder.

Advantages — Getting back to coated electrode welding, cost and versatility are the prime advantages of the method. For the small shop or intermittent user of welding, the low initial capital investment and low operating cost of equipment are bright spots. Further, its availability for use with many different metals by quickly changing rods and current settings is an important plus.

Even in the bigger shops where some of the automatic or semi-automatic welding methods are employed, "stick" welding is often used to tack parts together prior to automatic welding. Then, too, there are always the corners, overhead welds and tight spots that are usually best done by hand. Weld rates are generally good, though speed and quality are dependent on operator skill.

Disadvantages — On the debit side of the ledger, the labor-conscious production man would be quick to note that between 70 and 80 per cent of the total unit cost (per foot of bead, for instance) is tallied in the labor column. Add to this the fact that quality and speed are at the mercy of the operator, and manual coated electrode welding fast loses favor as a continuous production tool.

Other disadvantages of the process itself include flux cleanoff at finish of weld, metal spatter during welding, uneven bead, and of course the usual arc flash, heat and fumes. Method is undesirable for welding stainless steels and nonferrous metals and alloys. Summing up, the process is generally excellent in repair and maintenance but its production role, despite improvements in rods and fluxes and the trend towards more production welding, shows little sign of improving in an economy where labor is more expensive than equipment. Because of its head start, though, it should hold its dollar-volume lead for a number of years.

Recommended Processes for Welding Metals and Alloys

Welding process	Low-carbon mild steel; Types SAE 1010 SAE 1020	Medium-carbon steel; Types SAE 1030 SAE 1050	Wrought alloy steels; Types SAE 4130 SAE 4340	High-alloy stainless, austenitic; Types AISI 301-309-316	Stainless, ferritic and martensitic; Types AISI 405-430	High-temperature alloys; 19-9DL 16-25-6	Cast iron, gray iron
Shielded-metal-arc (coated electrode)	S	S	S	R	R	R	S
Submerged-arc	R	R	R	R	S	S	NR
Inert-gas tungsten-arc	R	R	R	R	S	S	S
Inert-gas metal-arc	S	S	S	R	S	S	NR

Welding process	Aluminum and its alloys	Nickel and its alloys	Copper and its alloys	Magnesium and its alloys	Precious metals Ag, Au, Pt and Ir	Titanium and its alloys	Rare metals U, Mo, V, Zr, W
Shielded metal-arc	S	R	NR	NA	NR	NA	NA
Submerged-arc	NR	S	NR	NA	NR	NA	NA
Inert-gas tungsten-arc	R	R	R	R	R	R	R
Inert-gas metal-arc	R	R	R	S	S	S	S*

S satisfactory, R recommended, NR not recommended, NA not applicable, *S Questionable.

From paper prepared by John J. Chyle, A. O. Smith Corp., Milwaukee

Linde

Submerged Arc

This is the process that has moved so rapidly into the field of production once completely dominated by the manual coated electrode method. It works best in medium to heavy sections in mild steels and high-strength low alloy steels, but good results can be obtained on straight chrome and nickel, Monel, Inconel, aluminum-bronze, copper-silicon alloys, chrome-nickel steels, higher alloy and air hardening steels.

How It Works—Process was designed specifically as a production tool. Bare wire electrode is fed automatically from reels, through insulated cable to the welding head. In operation, the exposed portion of the electrode between head and work is covered with a granular fluxing material which completely hides the arc and weld area. Portion of the flux in the immediate arc area is melted and flows evenly over the molten metal, protecting it from the atmosphere and helping to conduct the welding current to the base metal.

Equipment is either semi or completely automatic. In the latter the whole unit can be either self propelling on a guide rail or track, or mounted stationary with respect to a moving fixture. In the former case, a lightweight head with its own can of flux material can be manually operated in locations some distance away from power source and wire-feed reels.

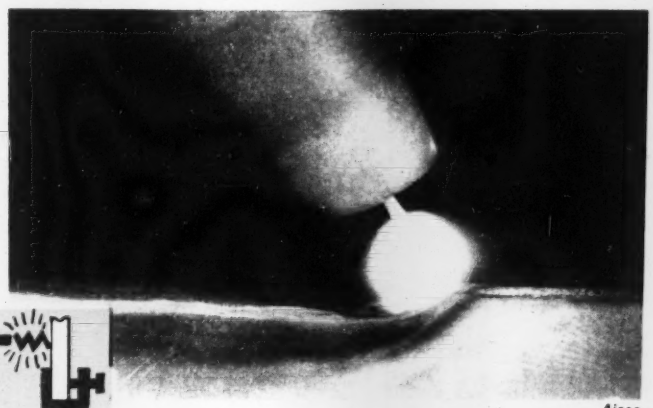
Advantages—Three characteristics of the process are responsible for all advantages: 1) Higher welding currents than any other process; 2) completely automatic control, 3) exclusion of all gases from welding zone. High currents mean rapid melting of base metal and rapid rate of rod deposit. As much as 200 inches per minute have been laid down in certain jobs. Then, too, the rapid, deep melting of base metal permits use of smaller Vees which greatly reduces rod requirements per foot.

There is no metal loss through arc spatter, and because electrode is long coil of wire, there are no waste stub ends. Edge preparation, other than straightening and cleaning, is practically nil. Clean-up is merely a matter of reclaiming unused flux (usually with a vacuum cleaner) and popping off the light even coat of fused flux from the weld.

Application Scope Because high welding currents (up to 4000 amp, ac or dc) create such a large pool of liquid metal, heavy welds must be kept horizontal to prevent spilling. Some lower-current welds can be inclined 7 or 8 degrees without trouble. This fact together with the higher capital investment involved generally will limit applications to fairly continuous operations. A semiautomatic machine, however, can pay for itself with repair and maintenance jobs in heavy equipment shops. Another plus: Welder need wear no helmet or flash goggles.

Fast as submerged arc process is, it has recently been stepped up with the appearance on the scene of multiple electrode welding. Using two or more electrodes in tandem, transverse or other positions, it is now possible to make extra deep or extra wide or even extra shallow high-speed welds.

Looking to the future, most welding authorities agree that submerged or hidden arc methods stand to gain greater usage in coming years, especially if the movement to design for welding in structural, machinery and transportation fields continues to grow.



Airco

Inert Gas-Shielded Arc

Use of inert gas-shielded welding was originally developed as a solution to the difficult problems involved in welding magnesium, but advantages of the system soon made it apparent that here was a welding technique with a much broader future. Not only is it generally accepted to be the best method of welding nonferrous metals and alloys. Many production men favor inert gas methods for alloy steel work and even mild steel welding.

Two Types — Not much more than ten years ago the first inert gas welding was introduced commercially. Equipment consisted of a tungsten electrode in a special holder fitted with emission holes for flowing helium or argon over the arc and weld area. External filler wire was fed by operator if base metal thickness demanded it. Not long after the appearance of this so-called nonconsumable electrode process, equipment builders removed the tungsten electrode, fitted the gun for continuous electrode wire feed, and the inert gas-shielded metallic arc process was born.

Features common to both types are many. Since there is no flux there can be no flux corrosion, and welding action can be clearly observed. Contour welding and intricate joints are greatly simplified. There is no weld contamination, and oxide scale is eliminated giving a flat, smooth joint. Thus weld and interpass cleaning and grinding costs are at a minimum. Of importance, too, especially in stainless steels, is the minimizing of carbide precipitation in the weld zone by better current control.

Plus For Nonconsumable While the two share many advantages, the tungsten arc process enjoys lower first cost, greater portability of equipment, no alloy loss in filler rod addition, and also the ability to spot weld mild and stainless steels up to 1/16 inch thick without external pressure. All types of joints can be made and in all positions, including vertical and overhead.

Welds can be made in material from 0.010 to 2 inches thick, but most economical field of operation is $\frac{1}{8}$ inch and below. Top current capacity of 500 amps allows full penetration of 3/32 to $\frac{1}{8}$ inch in single pass on butt welds of most metals. One of the original disadvantages of the process, hand feeding of filler metal, has been eliminated by the introduction of a gun with provisions for automatic wire feed into the tungsten arc. With current and rod feed rate set, operator strikes the arc and merely steers the torch easily even over irregular contours. Speeds up to 80 inches per minute can be attained.

Metallic Arc Tally — Principal advantage over the tungsten arc process is the wider range of metal thickness that can be welded. Add to this the 35 to 40 per cent lower argon consumption and 2 to 4 times greater wire deposition rate, and the metallic arc process is slightly ahead as a production tool. Furthermore, less heat is put into the base metal which means that certain heat treated parts are less apt to lose their properties.

Inert-gas metallic arc welding is gaining some favor in production of carbon steel parts. Big claim is that the continuous coil of electrode wire and automatic feed give rod feed rates as high as 190 feet per minute. High duty factor, less rod waste and no slag removal are reported to offset higher equipment and operating costs to the point of making the method competitive with other manual arc processes. It is still too soon to make a judgment.

Limitations—New as they are, it is difficult to appraise the shortcomings of the two inert gas techniques. From the standpoint of weld quality and operating versatility the processes are hard to beat. They eliminate many of the undesirable features that have been troubling welders and extend the field of commercial welding to almost any metal.

Sole disadvantage, and it's not a deterrent to many users, is the cost of equipment, gases, etc. Equipment manufacturers are working hard to improve speeds and ease of operation, so it is quite likely that as time passes the economic picture will improve.

Roundup—These then, are the major arc welding processes from which to choose. There are others carbon arc, atomic hydrogen, stud welding that play minor roles in production and maintenance shops, but they fall pretty much under the four major types. Atomic hydrogen, for instance, is similar to inert gas tungsten arc welding. Stud welding can be compared to metal electrode welding, the stud being the rod which is fused to the base metal. Carbon electrode welding has not ceased to exist, as the first portion of this article might have led you to believe, but is still in use even with inert gas shielding.

Obviously, on the basis of this writeup, you will not be completely equipped to pick the right welding method. There are many more variables to be considered than have been discussed here. But, working with reputable equipment builders, the task of justifying or rejecting the choice of a particular proposed installation can be lightened.

How To Tell A Good High Speed Tool

When You See One In A Microscope

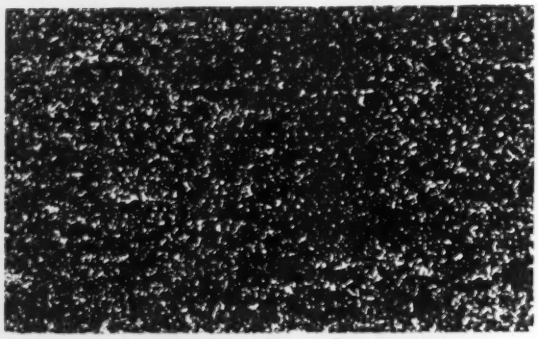
THIS CHART placed first in the ASM metallographic exhibit, Class 1, Machine Tools, at the recent 35th National Metal Exposition in Cleveland.

Material is high speed tool steel which has been hardened and tempered, except as noted. (Samples showing grain size are untempered.) Nital was the etchant. Oxidized sample is unetched.

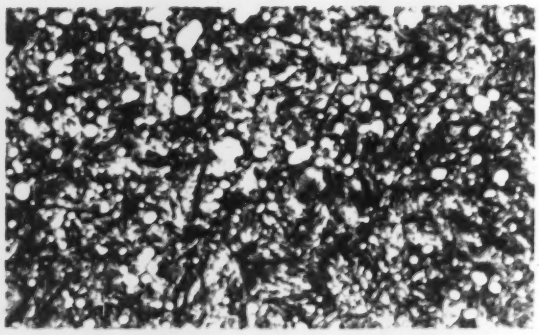
Uniformity of carbide distribution depends on section size involved. example shown is for 1-inch diameter bar.

SHOULD LOOK LIKE THIS

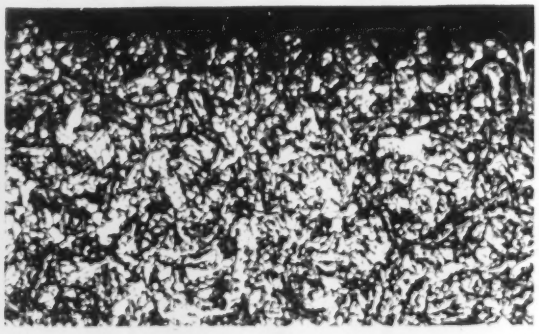
DISTRIBUTION OF CARBIDES
AT X100



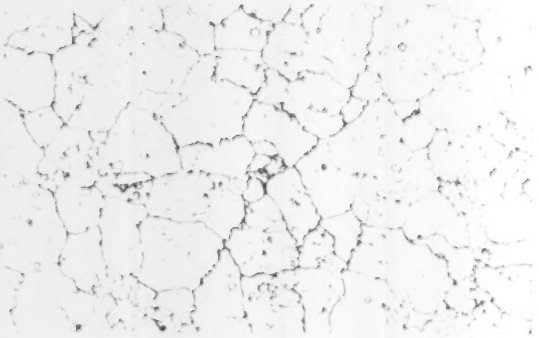
HEAT TREATED STRUCTURE
AT X1000



SURFACE CONDITION
AT X500



AUSTENITIC GRAIN SIZE
AT X500



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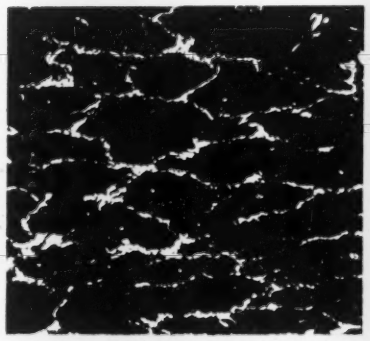

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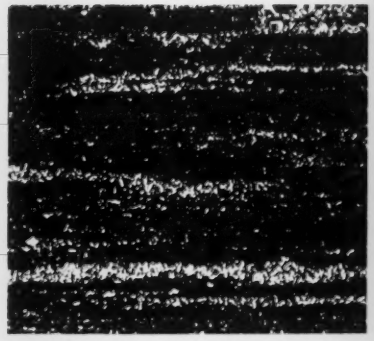

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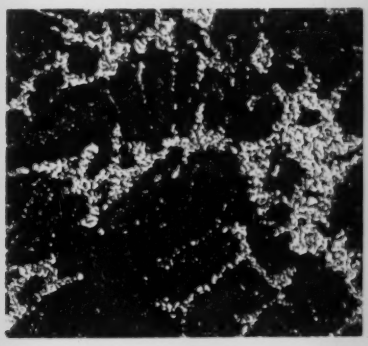

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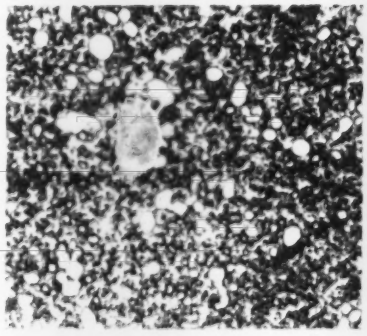

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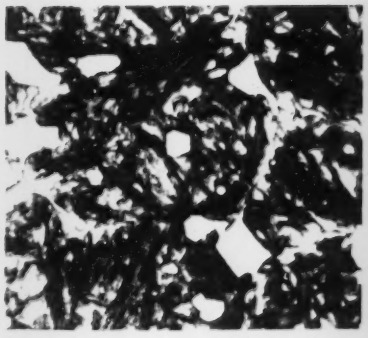

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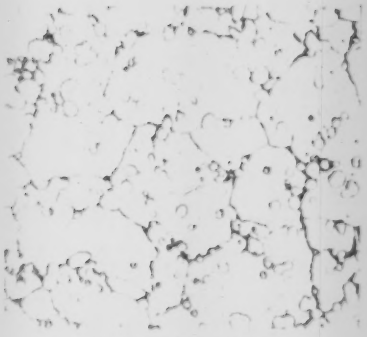

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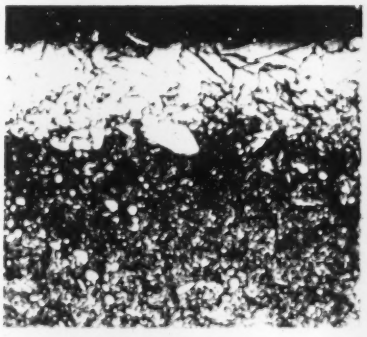

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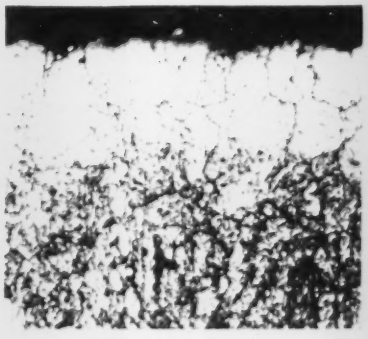

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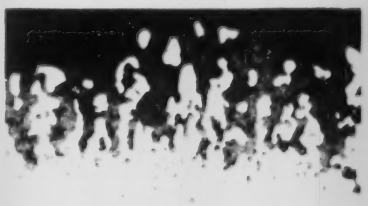

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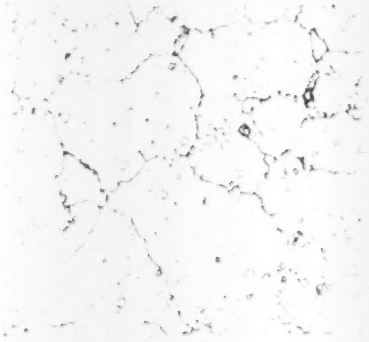

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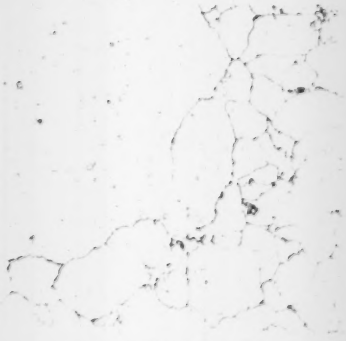
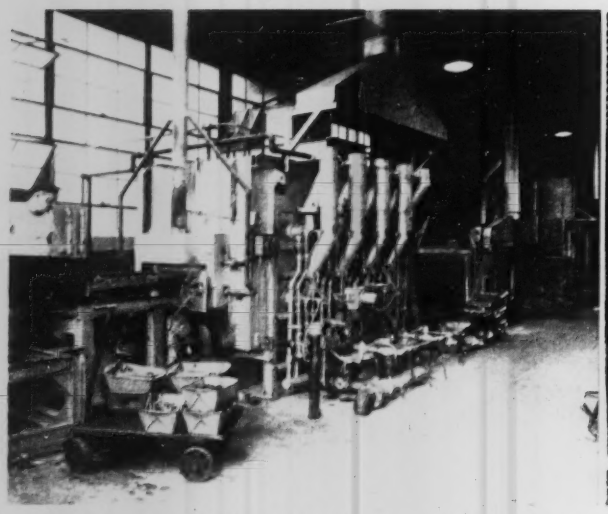
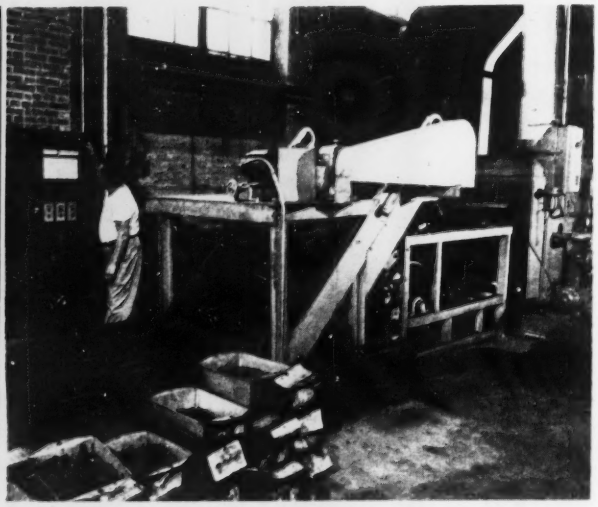


DUPLEX

By MICHAEL J. ANTUS
and
BIRGER L. JOHNSON
Latrobe Steel Co.
Latrobe, Pa.



Over-all view of Allen Mfg. Co.'s gas-fired electric furnace from charging end. Draw furnace is at right

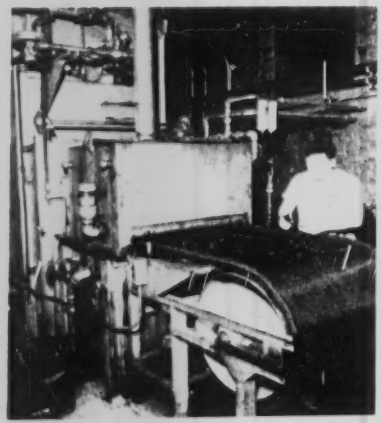


Conveyor emerges from covered quench tank, proceeding with parts into washer. Control panel is at left

Putting Heat-Treatment on the Line

This continuous conveyorized hardening and tempering furnace is operated by one man. It replaces an assortment of equipment for the same cycle

IMPROVED PRODUCT and single cycle continuous operation with only one operator spell profits at Allen Mfg. Co., Hartford, Conn. Carbon restoration and carbonitriding of socket-type screws were achieved in a gas-fired Shaker Hearth electric furnace designed by Westinghouse Electric Corp., Pittsburgh, in co-operation with Allen.



At discharge end, parts drop into tote boxes after going through draw furnace and final oil spray wash

Installation was made six months ago for continuous hardening and tempering of Allen hex socket screws. Now the unit operates six days a week, processing about 72,000 pounds of the company's products in this period.

Restoration Required—Chief engineer C. S. Gates explains that threads are weaker and have a tendency to shear off where there has been no carbon restoration.

"Some 90 per cent of our work material is cold headed, and this material is alloy steel subject to decarburization," he reports. In cold heading, decarburized wire will not harden on the surface. Purpose of carbon restoration is to have the same amount of carbon on the outside of the alloy steel as on the inside. That brings steel back to its normal carbon content specifications.

More Carbon—Carbonitriding in the electric furnace achieves a higher carbon content surface than exists on the inside, Mr. Gates points out. This furnishes a higher degree of hardness on the surface of products that call for that specification.

Other advantages pointed out by Alton W. Gross, plant metallurgist, show that hardening, quenching, washing and tempering are now done in one continuous cycle, by one operator. This formerly was a job that required several pieces of equipment and six men. Saving in floor space has been considerable.

Plating Speed — Time required for plating has also been reduced. About 15 per cent of Allen's production requires plating. Before installation of the new equipment, screws had to be cleaned by sandblasting. Now, products leaving the furnace can be plated after employing only normal rinsing methods.

12½" COPPER CIRCLE AS SUPPLIED
FIRST CUPPING DRAW; DIAMETER 7¼"
SECOND CUPPING DRAW; DIAMETER 5⅛"
LAST DRAW, WITH SPUN CONTOUR, BEADING, ROLLED EDGE
5⅜" BRASS CIRCLE
FORMED PERCOLATOR BOTTOM
8⅛" BRASS CIRCLE
DRAWN AND FORMED LID
2⅛" FORMED BRASS COMPONENT FOR HEATING ELEMENT

"Crown" automatic electric percolator, made by Robeson-Rochester Corp., Rochester 1, N.Y.

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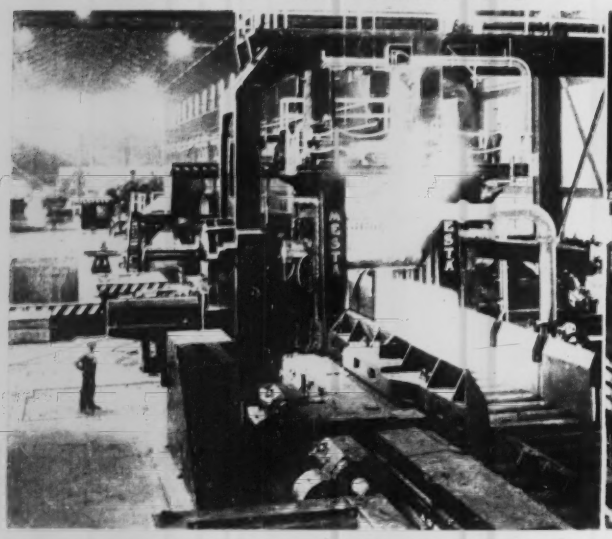
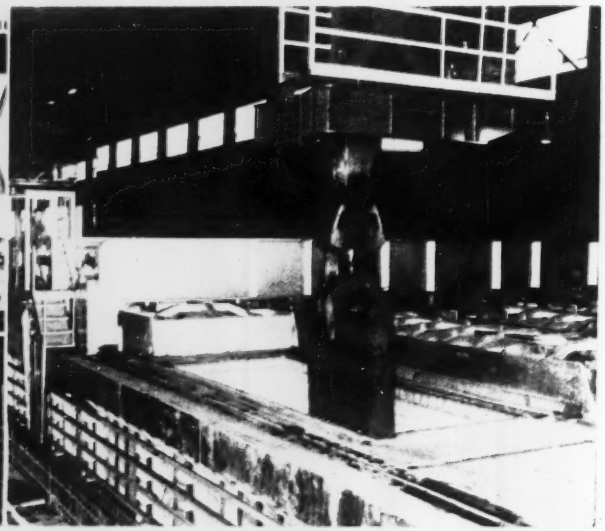


This 45 x 90-inch universal slabbing mill at Great Lakes' Ecorse works, one of the largest of its kind in this country, turns out big slabs which mean longer strip



Soaking pit furnaces for slabbing mill were designed to accommodate the 20-ton rectangular ingots. Here one is being lowered while operator waits to replace cover

Bigger Slabs Answer Strip Demands

Slabbing was the bottleneck to longer, weld-free strip, so they built a new 45 x 90 universal mill. It turns 20-ton flat ingots into strip for autobuilders

FOR A MOMENT it looked like a steel company executive was being rude the other day when someone asked him what changes there'd be in steelmaking practices in the next decade.

His answer: "Don't ask me. Ask our customers."

But a disarming smile from him quickly showed he had no intentions of being rude. He was merely using a curt answer to emphasize that in the final analysis the customers' needs and wants determine what you do in a steel plant.

Longer Coils—Take Great Lakes Steel Corp., for instance. At its plant in the Detroit suburb of Ecorse, Mich., it was able to turn out a wide steel sheet needed by its biggest customer the automobile industry. But production line operations, automaticity and a hawk-eyed watch on costs in the auto industry brought about a demand for steel sheet in coil form. Next, the auto industry wanted coils in longer lengths.

Great Lakes Steel, a subsidiary of National Steel Corp., was fulfilling that demand, but not as well or as economically as it wanted to. To supply the bigger coils, it had to weld several lengths of sheet together. This took time and added to the steel company's production costs. At the auto plants, the welds had to be cut out. This added to the cost of making autos, for not only did it take time to cut out the welds but a weld did not always come in the right place to keep scrap losses low with the least amount of effort.

Bigger Slabs—Great Lakes' ability to supply economical long lengths of continuous sheet unmarred by welds was limited largely by lack of slabbing facilities. So, the company set out on a $35-million project to eliminate this bottleneck.

On July 23, 1951, work of clearing a site for the new mill began. On Oct. 30, 1953, the new mill was in full operation two months ahead of schedule.

When you spend $35 million you want to get a value-packed product in return. You want it tailored precisely to your needs. You want it to save you money.

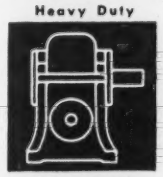
Here's How—With those things in mind, Great Lakes installed a universal slabbing mill that will take an ingot as large as 20 tons. To complement the mill's efficiency, the company installed additional soaking pits, an automatic scarfing machine, a slab shear and other necessary facilities.

The word "universal" as applied to this new mill means it is equipped with two horizontal rolls

You can TAKE YOUR CHOICE

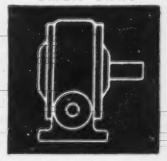
SINGLE REDUCTION

Heavy Duty

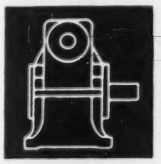


AT and AX

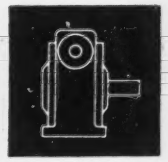
Small Units



AT



RT and RX



RT

VT

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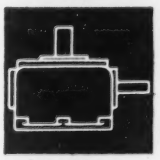
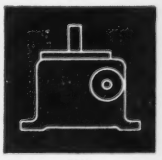


UT



UT

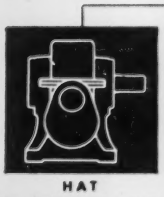
. . . they're all Philadelphia Worm Gear Speed Reducers

Philadelphia Worm Gear Speed Reducers vary in size and arrangement, but never in quality. Each unit is backed by 60 years of gear making experience and our reputation for the best in power transmission equipment.

Standard worm gear reducers are available in ratings to 250 horsepower, and ratios 3½:1 to 6300:1.

For full information on Worm Gear Speed Reducers, write for catalog WG51.

HELICAL WORM UNITS



HAT

HAX

HUT

HVT

DOUBLE REDUCTION

DAT and DAX

DVT

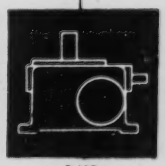
←Heavy Duty

DUT

Small Units→

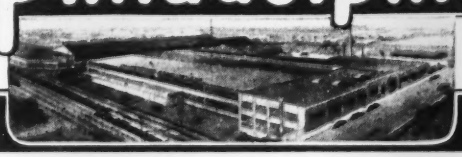
DAT

DVT



DUT

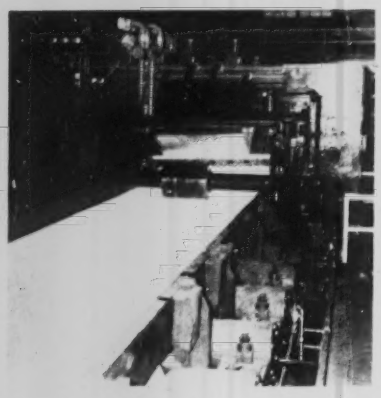
Philadelphia Gear Works, INC.



ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

Industrial Gears and Speed Reducers
LimiTorque Valve Controls



Automatic hot scarfing machine burns scale and defects from both top and bottom of the slab as it moves past. Unit's 144 burner jets do the job

and two vertical rolls. The two horizontal rolls are 45 inches in diameter and 90 inches in length and will roll slabs from $2^3/_4$ to 12 inches thick by 78 inches wide. The two vertical rolls are 37 inches in diameter and 90 inches in length and will roll slabs from 24 to 78 inches wide.

Horizontal portion of the mill requires four 3000-hp electric motors. Each of the two horizontal rolls is driven by two of these motors mounted on a single shaft. The vertical rolls require two 2000-hp electric motors mounted on a single shaft.

Tailored Ingots—To get as much efficiency as possible with this new slabbing mill, Great Lakes went clear back to the ingot and tailored it to shape a rectangular or slab shape. By pouring an ingot of this shape instead of square, a considerable amount of rolling on the slabbing mill is eliminated. Not only was the shape changed but the weight was boosted. Biggest ingot the company is using with the new facilities is 25 x 78 x 94 inches and weighs 20 tons.

To accommodate these rectangular ingots, six four-hole soaking pits in rectangular shape are provided. The pits are $8^1/_2$ feet wide, 25 feet long and 12 feet 9 inches deep. These furnaces have a monthly capacity of 180,000 tons of ingots.

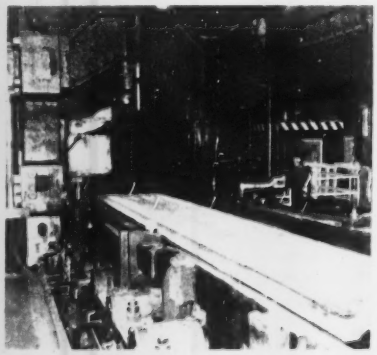
Delivering the ingots to the slabbing mill is an ingot car that travels 600 feet a minute. The mill's ingot turnaround tables and scales for weighing will handle ingots up to 30 tons. Ingots and slabs move along the electrically-driven roller tables at speeds ranging from 265 to 420 fpm.

Scarfs Both Sides—After the ingot has been rolled into a slab, the slab passes through an automatic hot scarfing machine which has 144 burner jets for simultaneously scarfing the top and bottom of the slab at speeds from 80 to 160 feet a minute. This scarfing, which produces a clean surface for further rolling, is accomplished by melting away a skin area of the slab with heat created by combustion of oxygen and steel as jets of the gas are directed against the hot steel.

After scarfing and being cut to desired lengths, slabs are reheated and reduced to hot band, in preparation for being rolled into cold-reduced sheet. The cutting of slabs to length and trimming of irregular ends is accomplished by a 2800-ton hydraulic upcut shear. It will cut a slab 12 inches thick by 76 inches wide. Hydraulic pressure of this shear is 2500 psi.

Slabs produced will range in weight as high as 16,945 pounds and will yield a hot continuous strip as long as 712 feet. Such a band would be 70 inches wide and 0.095-inch thick. Formerly, to make up such a coil required welding together four lengths.

Bigger Shipments — By being able to start with slabs weighing $7^1/_2$ to 8 tons, Great Lakes Steel is able to ship cold-rolled coils in widths of $61^1/_2$ to 73 inches weighing 7 to 8 tons without a weld, or 14 to 16 tons with one weld.



Before slab goes on to the hot mill, it is cut to rolling length, and ends get trimmed by this automatic shear

Before this new mill was put into operation, cold-rolled steel in these widths was produced from a $2^1/_2$-ton slab, and it required three welds to produce an 8-ton coil, or five welds in a 12-ton coil.

More Ingot Capacity—Not only did Great Lakes install a new slabbing mill and complementary equipment but it balanced out its facilities further by boosting its ingot capacity to 4 million tons through enlargement of ten of the company's 17 open hearths. All of this expanded capacity will be available by Dec. 1, 1953, a month ahead of schedule. In 1946, the company's ingot capacity was 2 million tons.

To help make the most efficient use of its steelmaking capacity, the company just completed installing two bessemer converters for processing charges for the open hearths. They already had two converters for this purpose.

Expansion of its ingot capacity and installation of its new slabbing mill will free Great Lakes Steel from dependence on other companies for ingots and semifinished steel. On and after Dec. 1, this will permit the company to turn out 2 million tons of cold-rolled sheets and 1 million tons of hot-rolled sheets in almost any lengths.

Fine Film Detects Details

An ultra-fine grain industrial x-ray film has been developed by Du Pont Photo Products Department. Known as Type 510, it can be used at low voltages (10-20 peak-kilovolts) to examine low-opacity materials, such as aluminum and magnesium. With million-volt x-ray or betatron equipment, it may be used to examine steel up to three inches in thickness.

Film can be used to advantage on subjects where very minute detail is desired, since the fine grain emulsion permits detection of tiny flaws in, for example, spot-welding in aluminum sheeting. It is made for radiography applications where minute detail is more important than speed; hence is only approximately one-third as fast as Du Pont Type 506 Industrial X-Ray film.

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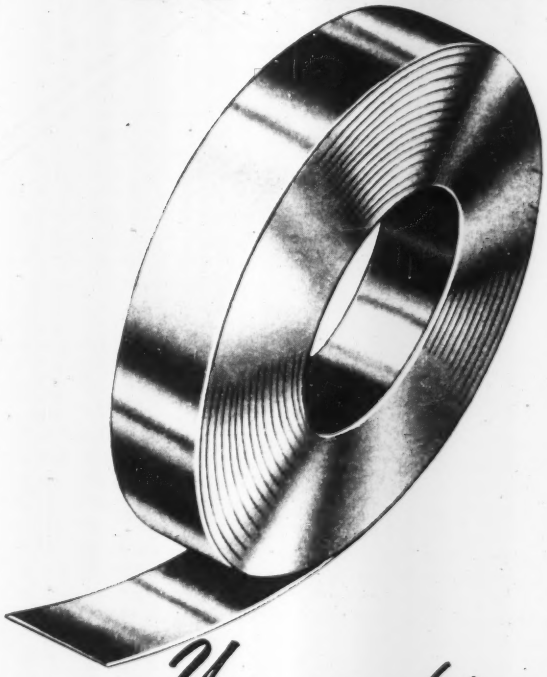
SPRING STEEL

. . . performance



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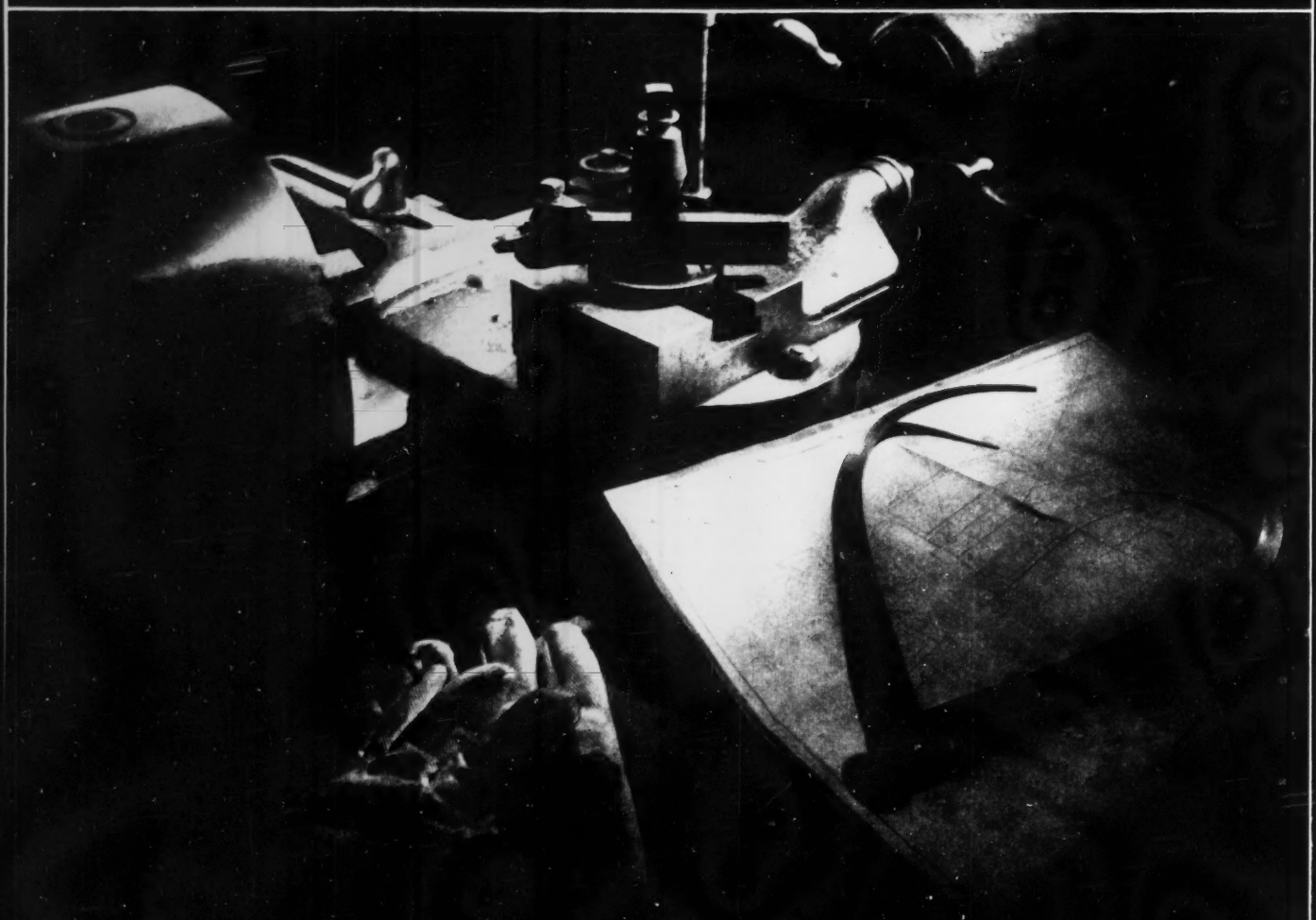
WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You don't lose production time waiting for steel!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

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You don't have to adjust your production schedule to match mill rollings when you use a U. S. Steel Supply warehouse as your own. We can make deliveries to suit *your* convenience. The stocks in our *local* warehouse and the resources of our 14 other warehouses promise delivery of the steel you need when, where and in the condition you want it. Contact your U. S. Steel Supply salesman.

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DIVISION

General Offices
208 So. La Salle St., Chicago 4, Ill.

USS

Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

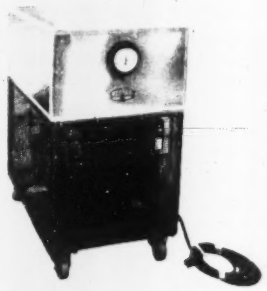
NEW PRODUCTS and equipment

Reply card on page 99 will bring you more information on any new products and equipment in this issue

Coolant Cooler

. . . greater temperature control

This cooler is built for high production machining operations requiring greater control over coolant temperature. It is designed for normal installation in the cool-



ant line between pump and nozzle. Result is said to be reduced rejection rate due to lower coolant temperature control.

Coolers are available in a variety of capacities and sizes for all coolant applications. Webber Mfg. Co. Inc., Dept. ST 297, 2740 Madison Ave., Indianapolis 3, Ind.

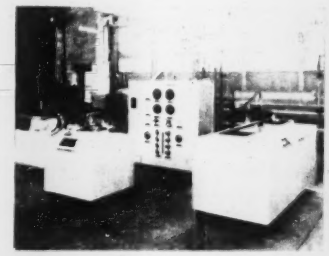
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Central Power Control

. . . jobs re-run at any time

This Flamatic power control is a central unit for precise control of fuel gas and oxygen for various selective heating operations. Control embodies automatic cycling except for loading and unloading parts. It permits the user to employ a wide variety of simple tooling and work handling operating units. Thus, he can go from one job to another without dismantling tooling, then return and re-run a job at any time with duplication of original results.

Unit also controls water pressure for cooling and quenching, air for actuating cylinders and controls electric power for automatic



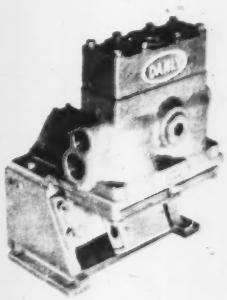
work movement and operational cycling. Three sizes are available, with two, four and six mixed gas circuits respectively. The largest has maximum capacity of 4500 Btu per hour. Cincinnati Milling Machine Co., Dept. ST, Cincinnati 9, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Clutch Air Valve

. . . increases operating safety

This dual air valve is designed specifically to eliminate one of the hazards of mechanical press operation accidental stroking due to



valve failure. It consists of two independent pilot-operated valves. These are actuated by electromagnets and the main valves by air.

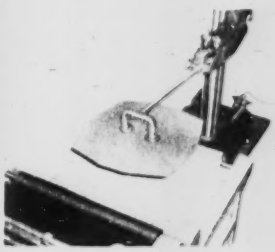
Pilot valve construction appreciably reduces inrush and holding current requirements. Two independent valves are built into a single unit and cross-ported in such a way as to provide maximum safety. The only chance for dangerous failure is when both sides of the valve fail simultaneously in the open position. Danly Machine Specialties Inc., Dept. ST, 2100 S. Laramie Ave., Chicago 50, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Automatic Vacuum Lift

. . . handles 40 x 40-inch sheets

Any nonporous metal sheets up to 40 x 40 inches can be handled by this vacuum lift at a rate of



one to six sheets per minute. Machine will pick up at any level from floor to 36 inches high, and is adjustable through this entire range.

It is also adjustable through 180-degree turn to be able to lay the sheet exactly into position in any repetitive operation. Air consumption per cycle is about 60 cu ft. Union Tool Corp., Dept. ST, Warsaw, Ind.

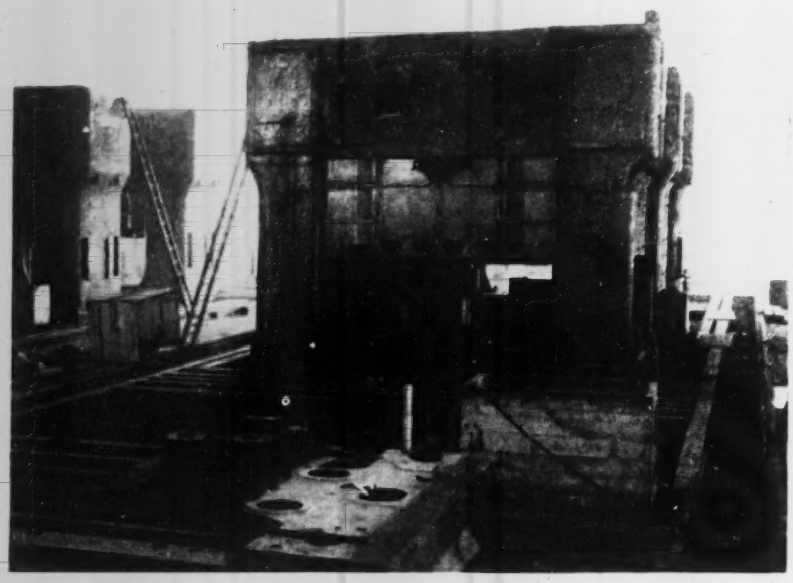
FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Improved Flooring

. . . withstands 20-ton loads

Improvement in Steelhard flooring compound enables it to withstand loads up to 20 tons. Now

These presses are costing money!



THE BEST production machinery in the world is a liability, rather than an asset, until it is properly installed and in operation.

The Commercial Contracting Corporation staff knows from experience that reducing the estimated time required to install a big press or a machine tool by a week or even a day is appreciated.

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NEW PRODUCTS and equipment

formulated with extra fine, tough granular plastic resins and non-stone aggregates, the compound is reported to produce a hard, smooth and resilient surface. Heavy hand trucks, and trucks with narrow steel wheels can roll easily.

The compound can be used to patch or resurface any concrete,

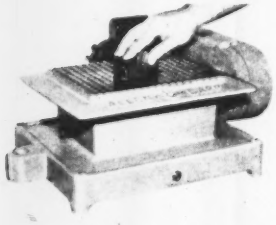
indoors or out. Applied without chipping or roughening the old surface, the flooring is ready for use within 4 to 6 hours after installation. Monroe Co. Inc., Dept. ST, 10703 Quebec Ave., Cleveland 6, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Bench-Type Lapping Machine

. . . *uses figure 8 motion*

This bench type lapping machine utilizes the figure 8 lapping motion, is a 150-pound unit that can



be mounted on any sturdy bench. It operates at four surface speeds from 250 to 1000 ipm. Its $\frac{1}{3}$-hp driving motor connects to the mechanism by means of V belt and step pulleys.

Serrated or smooth 8 x 12-inch lap plates of cast iron are used and are easily interchanged, while

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. End-Heating Unit

Gas Appliance Service, Inc.—Construction, specifications, typical production data and general information on the Hot Rod automatic end-heating unit are found in 2-page illustrated bulletin 360. Bar stock is automatically hopper-fed to a conveyor, carried through the heating zone, and released from the conveyor. Up to 4 in. on bar end can be heated.

70. 4-cu yd Shovel

Marion Power Shovel Co.—12-page illustrated bulletin 402-A describes model 111-M diesel shovel with 4-cu yd dipper. Unit is available as standard or long range shovel or dragline. Features are completely described and specs given.

71. Hydraulic Drill Unit

Rockwell Mfg. Co., Delta Power Tool Div.—20-page illustrated catalog AD 723 contains extensive engineering data on operation, capacity, available drive arrangements and power regulation of all Delta hydraulic drill units. Charts, line and schematic drawings are included.

72. Valves & Controls

Swartwout Co.—Line of pressure regulating valves and pressure master controls are described in 12-page illustrated bulletin S-22-CA. Cutaway and section views, dimensional and specification data are included, along with various models and application information.

73. Metal Plating Baths

Poor & Co., Proctor Div.—4-page illustrated bulletin provides condensed description of zinc, cadmium, copper and white alloy plating baths. Also described are secondary chromate treatments as preparation for painting and for corrosion resistance, as well as additional agents.

74. Roll Formed Shapes

Roll Formed Products Co.—Compiled to show advancements in the roll forming field, 24-page catalog 1053 contains timely information on designing, forming and mass producing shapes from ferrous and nonferrous metals. Six pages show various shapes which can be rolled on company's modern equipment. Sizes and thicknesses of lock seam tubing, standard angles and channels are included.

75. Dust Collectors

Prat-Daniel Corp.—8-page illustrated catalog covers design IP tubular dust and fly ash collectors. Units are efficient in dust ranges below 20 microns and are available in several arrangements. Complete selection data are provided together with general engineering information.

76. Cutting Fluids

Pure Oil Co.—"How to Simplify and Save with Pure Industrial Lubricants" is title of 16-page booklet on selection of cutting fluids. Testing procedures, tool care, machinability tables, cutting techniques, tool angles and rakes and clearances for cutters are covered in addition to application methods.

77. Rod & Wire Stripper

Lee Wilson Engineering Co.—How the Lee Wilson rod and wire coil loading and stripping machine simplifies rod and coil handling on and off annealing spindles is told and shown in 4-page folder. Line of multi-unit furnace spiders for wire annealing is also covered.

78. Cut-off Wheels

Norton Co.—36-page illustrated manual shows various types of abrasive cut-off wheels and machines, their selection, application and proper usage. Other data provided are helpful tables for wheel selection and conversion of wheel speeds to fpm values.

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7	17	27	37	47	57	67	77	87
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9	19	29	39	49	59	69	79	89
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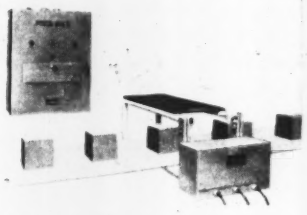
brackets cast in the base allow for addition of special hold-down devices for multiple piece lapping or for lapping of angled surfaces. Lopon Inc., Dept. ST, 1649 Sherwin Ave., Chicago 26, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Metal Detector

. . . for conveyor installations

General-purpose metal detector can be installed around conveyor systems without cutting the belt



and can be adapted to special applications. Device is used in manufacturing processes involving inspection of nonmagnetic and nonconductive materials.

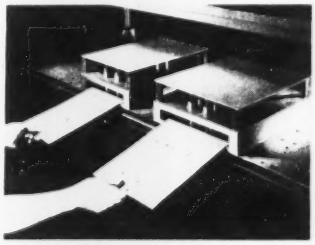
Belt speeds can range from 90 to 500 fpm. General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

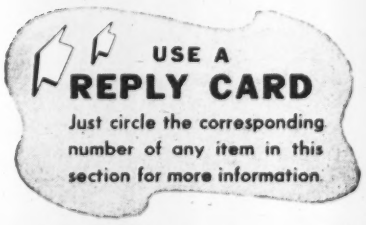
Hole Punching System

. . . setup made outside the press

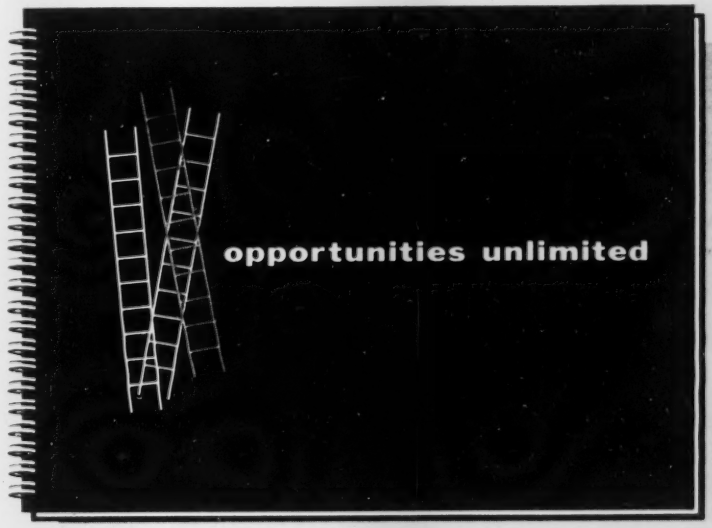
Unlimited patterns are possible with punch retainer plates in this multiple hole punching system.



The system provides simple, fast and economical sheet metal punch-



if you design or purchase metal parts



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ing by permitting the entire setup to be made outside the stamping press or press brake. In addition, assemblies and dies are interchangeable, permitting the same parts to be used and reused, minimizing parts inventory.

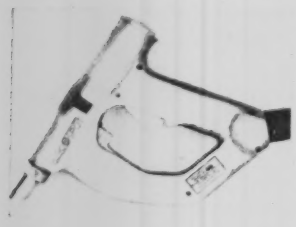
Boxes are available from 6 x 6 to 24 x 24 inches. Wales-Strippit Corp., Dept. ST, 345 Payne Ave., N. Tonowanda, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Lightweight Spot-Welder

. . . welds sheets to ⅛-inch

This lightweight spot welding gun uses a 3/32-inch nonconsumable thoriated tungsten electrode



and inert-gas shield. It makes instantaneous welds on stainless, mild, and alloy steels without aid of jigs or fixtures.

Aircospot unit consists of a hand gun, control panel and necessary hose and cable assemblies. Standard direct current power source is required. Gun is water-cooled, uses helium, argon or a mixture of the two for a shield. It is rated at 250 amp and makes welds on sheet metal up to $\frac{1}{8}$ inch thick. Air Reduction Sales Co., Dept. ST, 60 E. 42nd St., New York 17, N. Y.

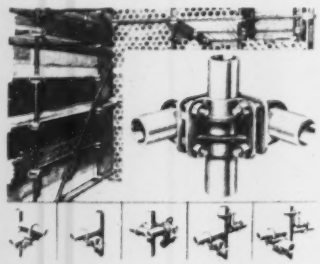
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Friction-Type Clamps

. . . with standard tube, pipe

Tube-Strut clamp is a fast-erecting and economical method of constructing storage and utility racks capable of carrying heavy loads in complete safety. Tubular structures for any requirements are erected rapidly by using standard tubing or pipe with the clamp system. No threading or welding and no skilled help are required.

Any number of tubes can be joined at right or oblique angles as desired. There are no limitations in positioning the coupler on the



pipe. Tubular Structures Corp. of America, Dept. ST, 2960 Marsh St., Los Angeles 39, Calif.

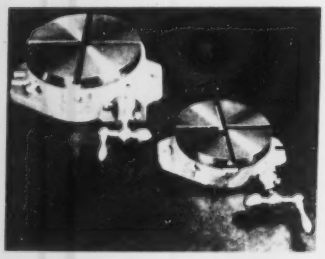
FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Expanded Rotary Table Line

. . . maximum vertical capacity

An 8-inch rotary table is an addition to the previous 6-inch line available from this manufacturer. Both models feature low height to permit maximum use of vertical machine capacity. The 8-inch unit measures 3-$\frac{7}{8}$ inches high.

Construction features a steel worm mounted on eccentric which can be engaged or disengaged from the gear to permit free-wheeling



of the table. Twin ball thrust bearings in the quill eliminate backlash between worm and gear. Benchmaster Mfg. Co., Dept. ST, 1835 W. Rosecrans Ave., Gardena, Calif.

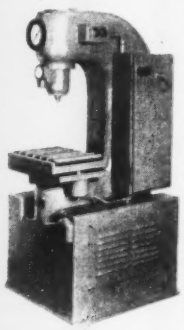
FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Production Hardness Tester

. . . fits into conveyor system

This production model Brinell hardness testing machine fits directly into a conveyor system. It is adapted from the manufacturer's standard hydraulically-operated direct reading type of tester. Result is greater facility in handling parts, plus capacity for faster testing process.

Roller conveyor is arranged in conjunction with the tester anvil. Latter consists of a series of hardened steel bars affixed to the lower portion of the machine's C frame. Rollers are interspersed between the bars, lowered and raised automatically during the testing cycle. Direct reading dial makes it unnecessary for the operator to measure the diameter of



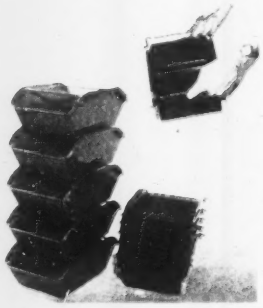
the Brinell impression. Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 21, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Small Parts Handler

. . . volume: 238 cu in.

Efficiency in handling very small parts is reported with this smaller NesTier box system, added to the manufacturer's two larger size models. Made of 20-gage steel, the boxes are capable of handling 200 pounds with standard handle, 400 pounds with heavy duty handle. Each weighs 3 pounds and has 238 cu in. volume. Boxes are



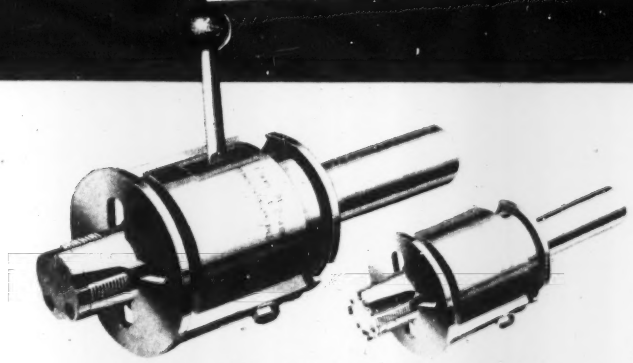
12 inches long, $7\frac{1}{4}$ inches wide and $4\frac{3}{4}$ inches deep.

Like the other models, these boxes nest and tier simply by handles being flipped at both ends. No special equipment is required for movement; they can be transported on pallets, trucks and wag-

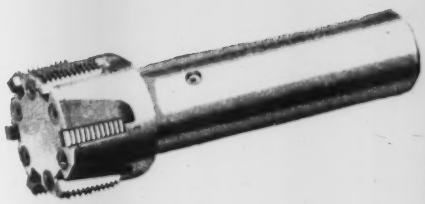
don't take chances when TAPPING

★ either in the quality of thread you need...

or on the time you expect to save

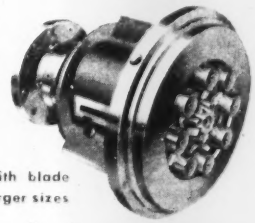


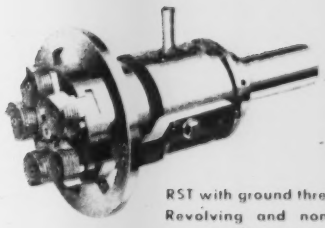
RST with ground thread radial blade chasers. Revolving and non-revolving. Range 1-1/4 to 4" in 8 sizes.



RSA Solid Adjustable Tap with ground thread radial blade chasers. Range 1-1/4 to 4" in 8 sizes.

RES-L Positive Receding Action Tap with differentially spaced ground thread circular chasers for 4-1/2 to 13-3/8 taper couplings. Two bodies and one additional nose piece cut entire range. Or with blade chasers, range 2-3/4 to 4". Larger sizes on application.





RST with ground thread circular chasers. Revolving and non-revolving. Range 3 to 5-1/2" with one body assembly and 3 core pieces.

Unless both have been engineered and proved out at the tool source, freed from experimental hazards such as down-time and scrap loss *in your shop*—your internal threading costs will still be a gamble.

NAMCO BASIC ADVANTAGES IN DESIGN – Relatively few parts, core piece rigidly supporting chasers. Instantaneous positive collapsing action so important on blind hole tapping. Parts hardened for wear, not just toughened, and completely precision ground for accuracy. Adjustment to fine diametric limits made by one screw and rigidly held. Chasers quickly removable for regrinding.

ADAPTABILITY WITH MINIMUM TOOLS. Each size RST non-revolving Tap is quickly changed for revolving spindle machines simply by removing reset handle in hood — using same chasers. Also interchangeable chasers between collapsible and solid adjustable types.

GROUND THREAD CHASERS – are standard for all types and sizes —radial blade chasers 1 1/4 to 4" range and the famous circular ground thread chasers for sizes 3 to 5". For the Oil Industry the RES-L perfected receding action with differentially spaced circular chasers has no equal.

Whether for class 3 threads in fine instrument work or dry seal couplings or medium tolerance jobs or commercial straight or taper threads—ask us to show you how these Namco precision taps with ground thread chasers can take the experimental headaches out of your tapping, give you smoother threads—and save you plenty.

Ask for specifications DT-52 or send sample

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Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle —Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.

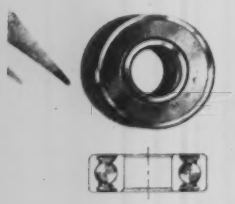
ons, or used on overhead conveyors with hangers. Charles William Doepke Mfg. Co., Dept. ST, Rossmoyne, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Modified Commercial Bearing

. . . has molded plastic seal

Using a molded plastic seal, manufacturer is making a commercial bearing for applications where speed and loads are moderate enough to allow use of this



type. In each case, model CS-3258 was used to replace a precision bearing, with savings reported as much as 60 per cent.

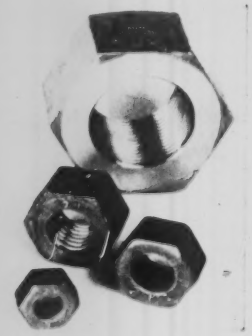
Bearing has carburized and hardened raceways. All surfaces are ground. Schatz Mfg. Co., Dept. ST, 6762 Fairview Ave., Poughkeepsie, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Fastener Line

. . . produced to U. S. standards

Fasteners made to American standards of application by Dutch manufacturers are being supplied



in the U. S. through this distributor. VvS group of five fastener manufacturers in the Netherlands provides a complete range of nuts, bolts and fasteners manufactured on Van Thiel hot pressing equipment and other Dutch processing equipment. Reynolds Fasteners Inc., Dept. ST, 68 Wall St., New York 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Truck Dumper Attachment

. . . 190-degree forward rotation

Rotary dumping mechanism slips readily onto the forks of manufacturer's FF-15 electric industrial truck, converting the truck from fork operation in less than 20 minutes. Dumping action permits forward rotation of 190 degrees by using hydraulically-actuated pinion gear arrangement.

Truck's permanently attached forks are hydraulically adjustable, facilitating clamping action for

large or small size materials. Automatic Transportation Co., Dept. ST, 149 W. 87 St., Chicago 20, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Power Tube Flarer

. . . gains high-volume production

Developed to put tube flaring on a high-volume production level, this power tube flarer produces 37-degree tube flares for use with standard Triple-lok and AN tube fittings. Flares meet following standards: AN, JIC, SAE Hydraulic and ASME.

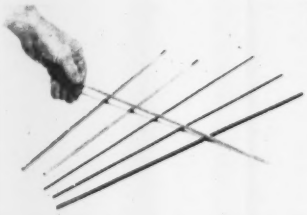
Machine will flare the full range of standard tube wall thicknesses and all tube sizes from $\frac{1}{8}$ inch through 2 inches OD. In addition to flaring, unit can be used for square-burring tubes through readily interchangeable heads and accessory attachments. Parker Appliance Co., Dept. ST, Cleveland 12, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Welding Rod Material

. . . repairs manganese castings

This manganese-nickel steel welding rod is used for repairing or building up worn or broken manganese steel castings. It can



also be used as a buildup material prior to applying hardfacing alloys to manganese steel parts. Called Walmang, the weld metal is reported to have excellent fusion, penetration and density characteristics, minimizing effects of welding heat on the parent metal.

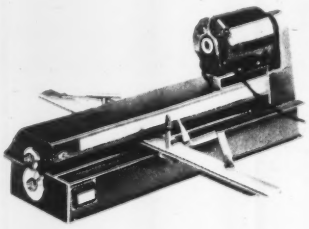
Rod can be applied as a weld deposit for repairing or salvaging a wide range of manganese steel castings. It can also be employed as a weld metal to attach cast replacement wear parts to such castings. Wall Colmonoy Corp., Dept. ST, 19345 John R St., Detroit 3, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Bench Model Metal Slitter

. . . net weight: 72 pounds

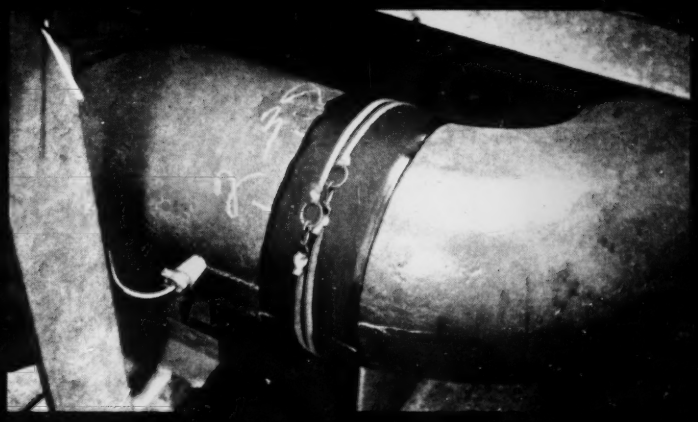
Bench model portable metal slitting shear is warranted to slit up to 20 gage mild steel at 62.5 fpm, at tolerances of 0.005-inch or less,



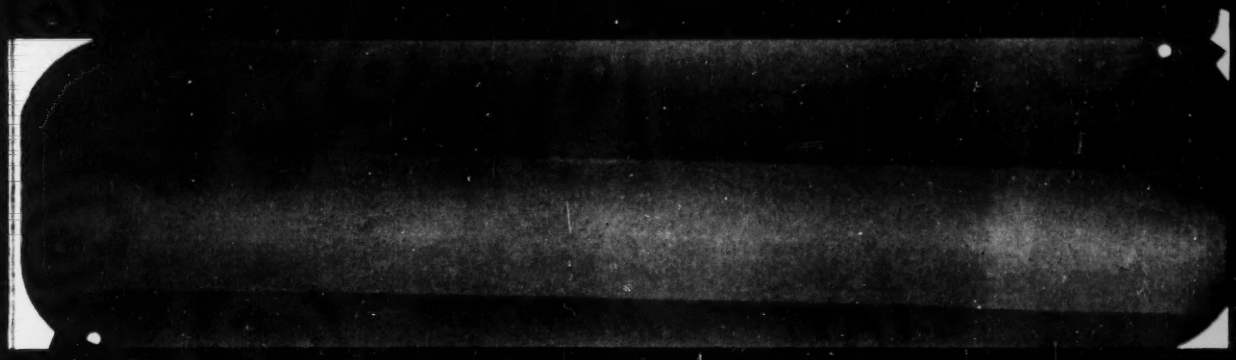
with minimum distortion. Having net weight of 72 pounds, the model JB-20 can be carried by one man, plugged into 110 v circuit.

Engineering features include all-steel cut reduction gears, protected against shop dirt, and oil impregnated porous bronze main bearings. Wilder Mfg. Co., Dept. ST, Box 880, Carmel, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19



This joint must carry water at 500°F and 1600 p.s.i.



RADIOGRAPHY says the weld's sound

To gain top efficiency, modern power plants are operating at higher pressures and higher temperatures—conditions which call for utmost dependability in the welded joints of the piping.

Here radiography is invaluable; it alone can prove the soundness of the welds.

In this way radiography has opened new fields to welders. In high pressure piping, in the manufacture of pressure vessels, and in other applications where welding was once banned, it is now an accepted procedure.

Radiography can help you build business as well as earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you, talk it over with your x-ray dealer.

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Radiography . . .

another important function of photography

Kodak
TRADE MARK

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Every day 200 Oakite Technical Service Representatives use Oakite cleaning materials and methods to help thousands of Oakite customers accomplish metal cleaning jobs that are important parts of big production operations.

When a busy customer sends a few words of appreciation, we treasure those words as a *success sentence* that we have helped write in his *success story*.

Here are brief explanations of the *success sentences* quoted above:

1. After 6 months use of Oakite Special Protective Oil for preventing rusting, this manufacturer of precision steel parts estimated savings at more than $6,000.
2. The use of Oakite Composition No. 95 for conditioning zinc-base die castings before plating cut cleaning rejects for this hardware manufacturer and showed other "very fine advantages."
3. Oakite CrysCoat HC put a heavy phosphate coating on 85,000 shells with "absolutely no trouble" according to a munitions maker, who added that "maintenance and control are very easy."
4. For burnishing, "Oakite Composition No. 3 is here to stay" says this maker of aircraft instrument parts, who adds "Pinions are polished to the roots of the gears. Magnesium parts are brilliant."

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FREE Ask for our booklet "*Some good things to know about Metal Cleaning*." It discusses our methods for:

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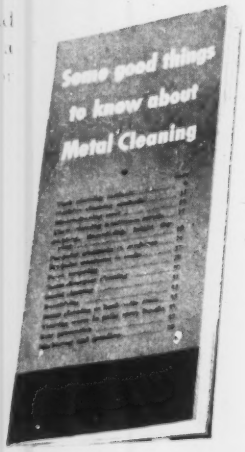

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CALENDAR OF MEETINGS

STEEL CALENDAR— Nov 23 ISSUE . . .

November 29-December 4, American Society of Mechanical Engineers: Annual meeting. Hotels Statler, McAlpin, Governor Clinton, New York. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

November 30-December 1, American Management Association: Special supervisory conference. Palmer House, Chicago. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

November 30-December 3, American Institute of Steel Construction Inc.: Annual convention. Boca Raton hotel and club, Boca Raton, Fla. Institute address: 101 Park Ave., New York 17. Secretary: M. Harvey Sinedley.

November 30-Dec. 5, Exposition of Chemical Industries: Commercial Museum and Convention Hall, Philadelphia. Information: Charles F. Roth, 24th Exposition of Chemical Industries, 480 Lexington Ave., New York.

December 1, Spring Manufacturers Association: Annual meeting. Biltmore hotel, New York. Association address: 249 Main St., Bristol, Conn. Secretary: George E. Underwood.

December 2-4, American Institute of Mining & Metallurgical Engineers: Annual electric furnace steel conference, Netherland Plaza hotel, Cincinnati. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

December 2-4, Society for Experimental Stress Analysis: Annual meeting, Hotel McAlpin, New York. Society address: P.O. Box 168, Cambridge 39, Mass. Secretary: W. M. Murray.

December 2-4, Mid-Century Conference on Resources for the Future: Washington. Information: Norvell W. Page, conference director, Resources For The Future Inc., 501 Stoneleigh Court, 1025 Connecticut Ave. NW, Washington.

December 3, American Iron & Steel Institute: Philadelphia regional technical meeting. Warwick hotel, Philadelphia. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

December 3-4, Society of the Plastics Industry Inc.: Film, sheeting and coated fabrics division conference, Hotel Commodore, New York. Society address: 67 W. 44th St., New York 36. Executive vice president: William T. Cruse.

December 5, American Electroplaters' Society: Research committee conference. Statler hotel, Detroit. Society address: 445 Broad St., Newark 2, N. J. Executive secretary: P. Peter Kovalis.

December 7-10, Scientific Apparatus Makers Association: Midyear meeting. Laboratory apparatus, equipment and optical sections. Boca Raton club, Boca Raton, Fla. Association address: 20 N. Wacker Dr., Chicago 6. Executive vice president: Kenneth Anderson.

December 8-10, American Institute of Electrical Engineers: AIEE-ACM-IRE Eastern computer conference. Statler hotel, Washington. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

December 9, Steel Kitchen Cabinet Manufacturers Association: Winter meeting, Edgewater Beach hotel, Chicago. Association address: 1008 Engineers Bldg., Cleveland. Executive secretary: Arthur J. Tuscany Jr.

December 13-16, American Institute of Chemical Engineers: Annual meeting. Hotel Jefferson, St. Louis. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

December 16-18, Material Handling Institute: Annual meeting, Hotel Statler, New York. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. K. Hanson.

December 29, American Association for the Advancement of Science: Panel discussion on visual performance and testing procedures. Bradford hotel, Boston. Panel chairman: Dr. N. Franklin Stump, Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

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The New Thompson Type 2F is a

SUPER PRECISION

Tool Room Grinder

WEBBER GAGE COMPANY

Thompson 2F Grinder Photographed in the Webber Gage Co., Cleveland Plant

COMPARE THIS NEW 8 x 10 x 24 TOOL ROOM GRINDER

When working to a tolerance of four millionths of an inch such as is observed when making Webber Gage Blocks, the rough or preliminary grinding plays an important role in keeping cost of the final finishing within reasonable limits.

Compare These Features:

- HARDENED AND GROUND cross slide ways completely sealed
- One shot lubrication to cross slide ways and internal saddle bearings
- HARDENED AND GROUND sealed anti-friction vertical slide
- HARDENED AND GROUND BED WAYS with automatic lubrication
- 3600 1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated

Hands control panel

- Elevation micrometer stop graduated in .0001"
- GROUND THREAD FEED SCREW
- Automatic wheel TRUING device
- Longitudinal hand wheel with automatic engagement
- Hydraulic head movement throttle with rapid traverse
- Hydraulic table movement throttle
- Elevating hand wheel graduated in .0005"
- GROUND THREAD FEED SCREW

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right at the work-with the

P&H Welding Twins

equipped with Dial-lectric Control

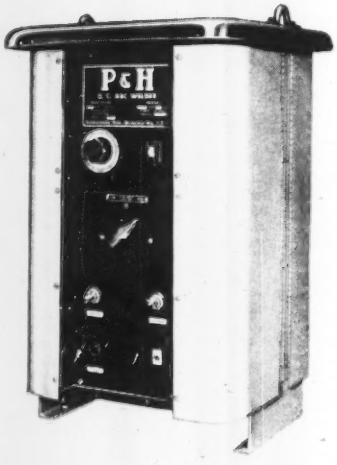
Dial-lectric Control is an exclusive P&H feature that helps you weld faster, easier, better — at less cost!

P&H AC WELDER

As easy as tuning your radio — just turn the radio-type knob of the Dial-lectric Instantaneous Remote Control (or step on a foot treadle), to adjust heat accurately. Easy, quick-start arc. No hard-working cranks to turn. No moving parts to cause delays or maintenance expense. Sizes up to 625 amps., NEMA rated. Connectable to 220 and 440 volts.

P&H DC RECTIFIER WELDER

Also equipped with hand-or foot-operated Dial-lectric Control, to give the welder fingertip heat control at the work. No hard-working cranks to turn. No moving parts to wear out. Saves on power costs under load — and during idle and no-load periods. Protects the primary input line against unbalanced conditions. Three sizes, 200, 300, and 500 amps., NEMA rated.



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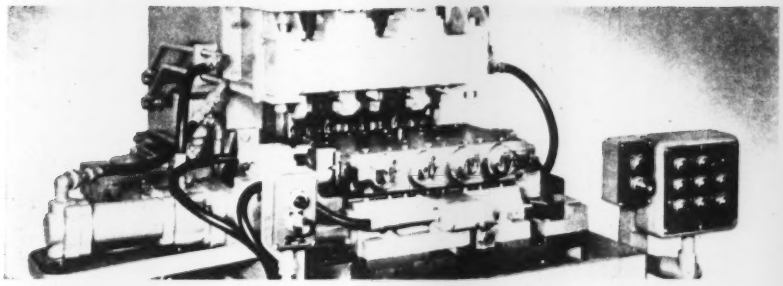


Center positions on this broaching setup are for forming the first two tangs on automatic transmission parts. Outer positions complete the job

Gears Broached in Two Steps

Indexing fixture holds eight parts. While four are being cut, other four are in load-unload positions

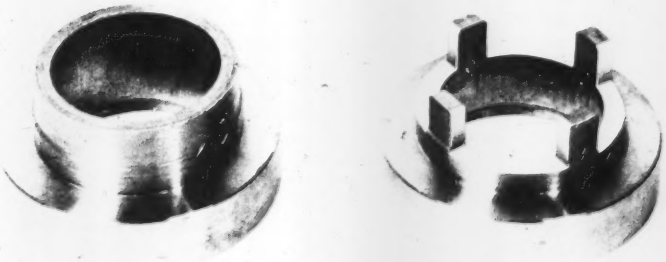
SINGLE RAM broaching machine with a hydraulic indexing fixture, helps a leading automaker produce 280 automatic transmission parts per hour at 85 per cent efficiency. Part is a front oil pump drive gear for an automatic transmission. The operation consists of broaching four tangs, 0.340 to 0.350-inch wide out of AISI G 1117 steel. Depth of the four slots broached is 0.431-inch.

Two operations are required to form the four tanks on a RS-6-54 single ram broaching machine made by Colonial Broach Co., Detroit. Four parts are broached at once on a two-sided fixture. One side is loaded and unloaded during the broaching operation on the opposite side.

Outside for Finishing — While two blanks are having their first pair of opposed tangs broached in the center positions on the fixture, two others are simultaneously being completed in the outside positions. To prevent distortion or springing of the tangs during the broaching operation, back-up bars are mounted vertically on the face of the fixture.

The fixture is then indexed hydraulically 180 degrees, the two outside parts unloaded, the two partially completed gear blanks moved to the outside positions and two new blanks placed on the two center work holders. The unloading of the parts is facilitated by an automatic parts ejector which ejects the parts after each index. To insure that all four tangs are properly spaced 90 degrees apart, hinged locating arms at the outside of the fixture line up the tangs broached in the first operation for the second cut.

Gear blanks are held in position by overhead hydraulic cylinders with equalizers, one cylinder for each two stations.



Blank for gear is at left. Finished part, right, has four broached tangs

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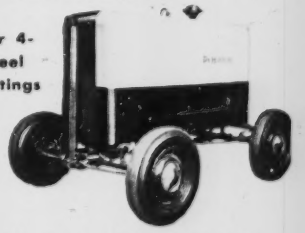

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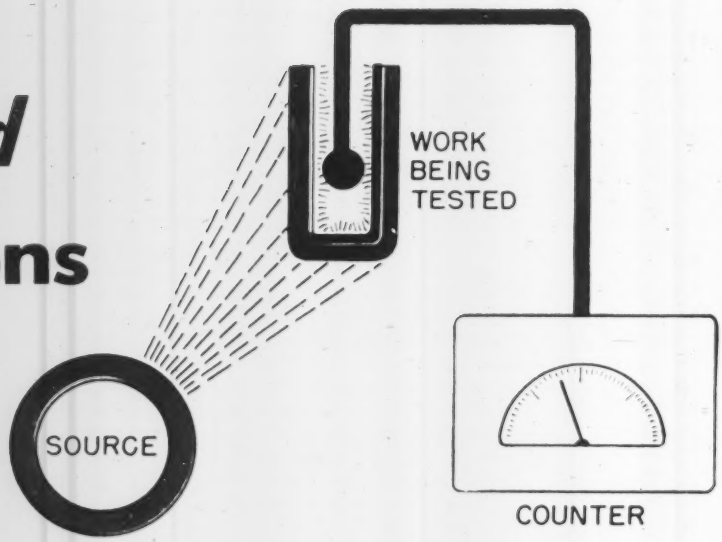


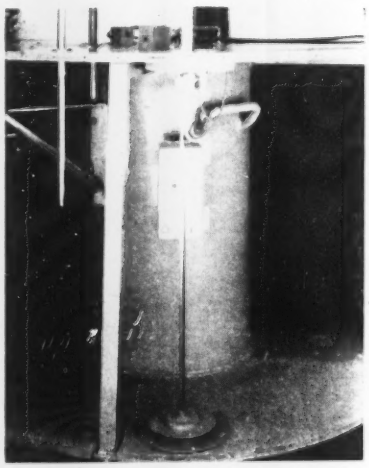
Nondestructive testing methods are gaining wide application. Here beta particles emitted from silver plate on waveguides are used to measure thickness of plate

INDUSTRY has been quick to take advantage of advances in fundamental science. In the past few years, the most striking example of this close relationship is the ever expanding use of the principles of nuclear physics in the practical problems of industry. By now, almost every industrial group is acquainted with the utility of radioisotopes and tracer techniques.

There is appearing on the horizon a new method of using nuclear properties for the solution of many difficult industrial bottlenecks. This technique is known as neutron activation analysis, and really consists of radioisotope production in miniature. It promises to be an extremely sensitive and versatile method of detecting the presence of specific elements under otherwise difficult circumstances. In fact, through neutron activation a new type of non-destructive testing may be achieved.

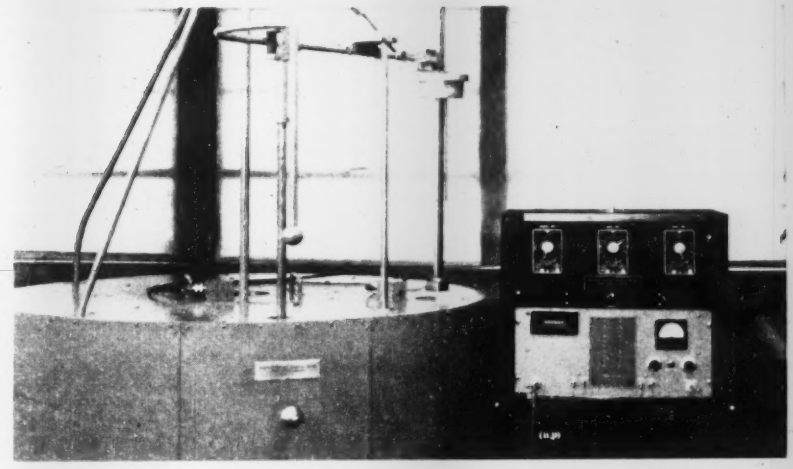
Application—For example, consider the nondestructive measurement of thickness of silver plate on the internal surface of radar waveguides. This is an important test procedure because the thin layer of silver provides a highly conductive skin for the radar energy, and it is essential to have a uniform coating so that signal attenuation is not excessive.

In testing the silver thickness at several points within the waveguide (which is essentially a pipe of rectangular cross section), pre-



Beta ray counter (foreground) is a specially-designed, thin-window Geiger tube placed inside waveguide

By H. V. WATTS and L. REIFFEL
Armour Research Foundation
of Illinois Institute of Technology
Chicago



Instrument for measuring the thickness of the silver plating on radar waveguides. Irradiation tank is on the left. Controls are shown on the right

vious techniques have required sectioning the waveguides, metallographic polishing and microscopic examination.

Testing by this method is time-consuming and expensive, since the section of guide tested is destroyed in the process. Need for a fast, non-destructive inspection technique is plainly evident.

Instrument based on neutron activation analysis has been developed and built by Armour Research Foundation for the Signal Corps Engineering Laboratories of Fort Monmouth, N. J. It is capable of measuring the silver thickness (in the range of 0.001 to 0.0001-inch) plated on brass of 0.050-inch thickness at any point in a rectangular waveguide up to three feet in length.

This measurement, obtainable in the order of five minutes, gives an average silver thickness over an area of one square centimeter and is accurate to ten one-millionths of an inch. The general method can be applied to innumerable other inspection and test problems.

Method—Neutron activation requires the bombardment of nuclei with neutrons, producing unstable isotopic forms of the nuclei which decay to stable states by emission of nuclear radiation. Probability of a neutron striking and activating a nucleus is given by the "activation cross section" or so many square centimeters per nucleus; resultant decay is characterized by the type and energy of the radiation and the half-life of the activity.

A method utilizing neutron activation is applicable to the measurement of an element plated on or embedded in a matrix of other elements whose "cross sections" are small compared to that of the element to be estimated, or when energies of radiation and/or half-lives differ sufficiently to allow discrimination in detection, or in time.

Problem of measuring a thin film of silver plated on brass is quite adaptable to this type of analysis.

By comparing the characteristics of the isotopes of silver and the isotopes of copper and zinc (the major constituents of brass), it is seen that the silver isotopes have the larger cross-sections and the shorter half-lives, both of which are advantageous to the method, since the activity induced for short neutron irradiation times is directly proportional to cross section and inversely proportional to half-life. Furthermore, the active silver isotopes emit β-particles (high speed electrons) of energy great enough to be easily detected.

Instrument—Basic requirements for an apparatus to accomplish these measurements are: 1) Slow neutron flux for activation; 2) a beta particle detector to count the induced activity; and 3) a time control circuit to maintain constancy for each determination.

The irradiation is performed in a cylindrical steel water tank, 10 inches in diameter and 34 inches high. Water serves as the moderating (slowing-down) medium for the neutrons from a 200 mg. radium-beryllium neutron source. It is held in a horizontal plane 19 inches from the bottom of the tank (to permit irradiation of a three foot waveguide at any point) and about 3 cm from the waveguide surface. Lead shielding is formed around the tank to absorb the hard gamma radiation from the radium.

The beta-particle detector is a specially-designed, thin-window Geiger tube developed by the Foundation.

This special tube is limited in size by the inner dimensions of a 1 x $\frac{1}{2}$-inch waveguide, since the detector must be placed inside the waveguide adjacent to the silver. Absorption of beta particles by the 50-mil thickness of brass prohibits counting from the outside surface of waveguide.

Waveguide is rigidly held and positioned by a mechanism bolted directly to the irradiation tank. By this mechanism the waveguide is correctly placed either in activate or count position by the operator with the time schedule automatically set by a system of three elapse timers with associated circuitry and alarms.

Outlook—This instrument is but one example of what can be done with the neutron activation technique. The non-destructiveness of the method is evident from the fact that only one atom in approximately 10^{16} is activated and transformed at the point of measurement.

Since there are almost 500 isotopes which lend themselves more or less readily to neutron activation, this method of nondestructive testing is one that should see great development in the very near future.

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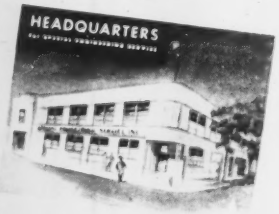

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E S S

WITH METHODS AND DESIGN

Test Tube Soil Corrosion

NBS lab cells produce data on ferrous corrosion in soils in only six months

STUDY by National Bureau of Standards shows that reliable data on corrosion of ferrous metals in soils of various types can be obtained in the laboratory in a period of six months. Usually field tests lasting 10 years or more are required.

In the NBS investigation, corrosion was produced in small laboratory cells by differential aeration of metal discs in contact with soil within the cells. Results for 15 different soils showed good correlation with corrosion observed on wrought specimens in long-term exposure tests. The technique used by the bureau should provide a basis for predicting service of iron and steel structures exposed to various soils.

Oxygen Accessibility—Corrosion of metals in many soils is attributed chiefly to differences in accessibility of oxygen to surface. Differences in oxygen concentration create differences in potential of various areas, resulting in flow of electric currents through the soil from oxygen-deficient areas (anodes) to those areas (cathodes) receiving more oxygen. The laboratory corrosion cells used by NBS made use of this principle.

Each cell consisted of a cylindrical Lucite enclosure containing two short-circuited disc-shaped electrodes of the same material, iron or steel. One electrode was solid, the other perforated. They were separated by a layer of moist soil. Edges and one face of each of the two electrodes were covered with bituminous paint. Layer of moist soil in contact with the coated side of the perforated electrode regulated diffusion of air to electrodes.

Relative Rates—If corrosion of ferrous metals in all soils proceeded at a rate that was constant with time, weight-loss measurements made after a short arbitrary period of exposure should indicate relative rates of corrosion, assuming negligible cleaning errors. Actually, corrosion in soils may proceed at a rate proportional to time, or may somtimes cease entirely, depending on the type of soil. It was thus nec-

essary to operate the laboratory corrosion cells for a sufficiently long period to produce effects comparable to those shown by field exposure tests.

In the NBS investigations, corrosion cells were kept on short circuit for six months. During this time periodic measurements of cell current permitted study of the progress of corrosion with time. At the end of the period the combined weight losses of the two electrodes were taken as the measure of corrosion.

Evaluation — To evaluate the laboratory corrosion cell as a means for predicting corrosion in the field, samples of soil collected at 15 exposure sites were used. Results were correlated with weight-loss measurements made on short lengths of steel and wrought iron pipe which had been exposed for 10 years at the same 15 localities.

An empirical equation relating the laboratory and field data indicated that the laboratory measurements could be used to predict field weight losses with root-mean-square error of about plus or minus 4 oz/ft² for corrosion rates ranging from 2.5 to 30 oz/ft² for the 10-year exposure period. Because the 15 soils covered the range of corrosivity of the soils of the United States, this empirical relationship may be applicable to any soil.

Effects of Variables — It was found that the corrosion cell could detect significant differences between corrosion rates of cast iron and steel. Thus, the cell might be used to study effects of variables, including composition upon the corrosion rates of steels. It is also reasonable to expect that laboratory corrosion cells could be used to predict the corrosion of nonferrous metals—copper, brasses, lead, zinc and possibly aluminum—in various kinds of soils.

Although the bureau says measurements with the laboratory cell should not be considered as replacing field exposure tests entirely, they report it is unlikely that materials which corrode at the same rate in the laboratory would corrode at significantly different rates in the field. Hence, the corrosion cell should serve a useful purpose in the selection of materials for field exposure tests.

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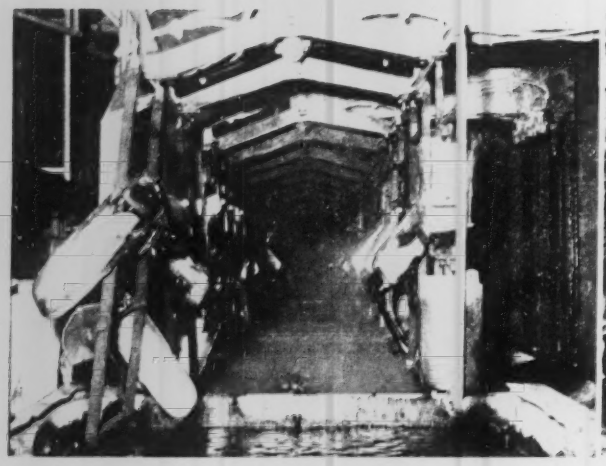
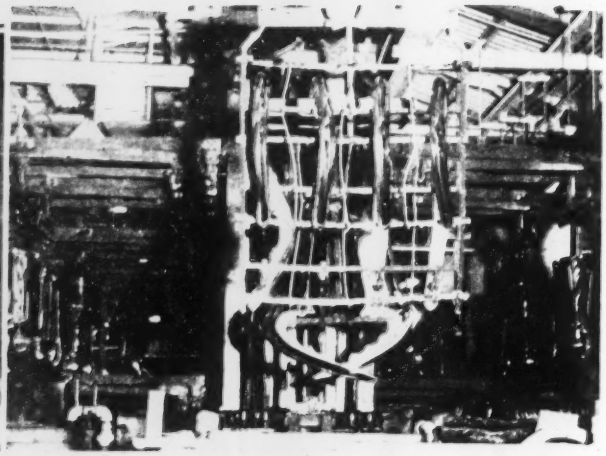


Bumper parts at Cadillac's plating department dropped and spray cleaned before being nickel and chrome plated



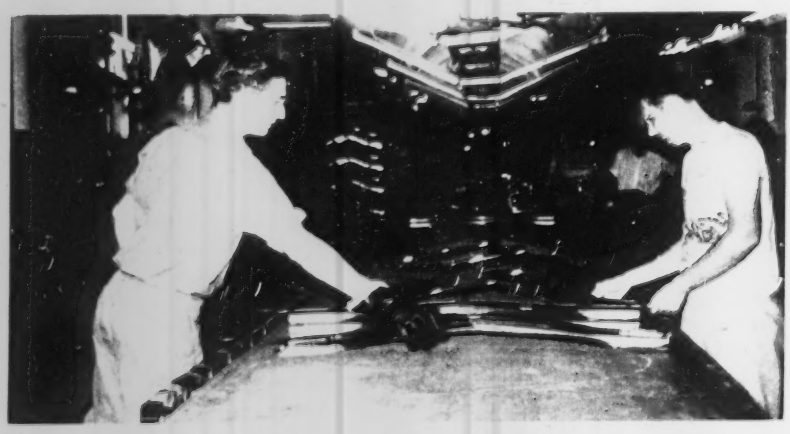
Chrome plated bumper and grille parts receive their final dip rinse before being subjected to inspection

Plating Shares Spotlight With Design

Sold on the policy of doing its own chrome plating, this General Motors division makes use of thorough conveyorization, close control to get results that spell sales promotion

CADILLAC drivers who revel in the top-notch bright work characteristic of their autos' appearance generally attribute it to a well-known class-consious design approach. While this is true, the plating story behind that effect reveals smoothly designed processes with manual operation minimized, skilled craftsmanship and equally important a substantial thickness of corrosion-resistant materials.

The GM division is sold on the policy of doing its own supervision of final product. It adopted chrome plating as standard in 1929, since then has done as much bright work as possible in its own plating department. Right now, that means about 80 per cent of the Cadillac's total plated parts.



Parts are placed on a belt conveyor for individual inspection under indirect lighting. Thorough laboratory spot check follows to insure quality

Conveyorized Sequence — Automatic machines enable the division to plate the majority of parts with manual operations held to a minimum. Actual acts of conveying stock through the sequence of operations are done entirely by machine. Plating rack is designed to produce uniform distribution of current and to hold parts in the most desirable plating position.

Racking and unracking of parts is done manually to assure proper contacts and prevent scratching or damage to parts.

Plating Steel—Steel parts are polished according to requirements. Some get a first rough polish on a 120-grit wheel to remove imperfections, then are polished with a 150-grit wheel followed by a 180-grit oil polishing wheel. Others require only a 180 or 220-grit oil polishing wheel to obtain proper finish before plating.

After polishing, racked parts get a 0.01-inch copper plate, electrodeposited in an automatic copper plating machine. Then special material handling equipment takes over to move parts through a buf-

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	OIL "A"	OIL "B"	ANTISEP BASE
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Tool	139.69	137.55	134.76
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fing operation. Mirror bright finish results when buffing compound is applied as cloth wheels turn at about 7000 sfm.

Following this, parts are again racked and placed on an automatic copper and nickel plating machine which electrodeposits 0.0005-inch more copper. The same machine follows with 0.001-inch of bright nickel to impart corrosion protection and desired appearance to base metal. Sometimes nickel coloring or buffing is necessary to gain perfect bright finish before chrome plating.

Then parts are racked again, placed on an automatic plater and chrome plate is electrodeposited to 0.000010-inch.

Inspection — Operation sequence continues when parts are unracked onto an inspection conveyor belt. Here indirect lighting aids inspectors.

In addition to this visual going-over, parts are spot-checked in the laboratory where plating is examined microscopically for thickness and salt spray tests check corrosion resistance.

To maintain uniformity, the lab makes frequent analyses of every plating and processing solution to maintain its formula throughout the operation.

Zinc and Stainless—Where zinc die cast parts are plated, process is altered slightly due to restrictions on use of nickel. To compensate for elimination of nickel plating step, this process includes a final clear enameling.

Method used to apply the enamel calls for parts to be cleaned by dipping, dried and dipped again in a vat of enamel, then hardened by baking.

Stainless or chrome steel gets another treatment. Parts of these materials are oil polished on a 420-grit sheepskin wheel, buffed and chrome plated on an automatic machine. Last step is color buffing.

Nothing Replaces Nickel — The division turns thumbs down on the several nickel substitutes, agreeing none brings quality of the chrome up to the standard set by nickel with chrome. When government restrictions go, the automaker says it will return to full use of nickel to the extent it is available.

For HYDRAULIC presses, too . . . it pays to specify BLISS

New BLISS HYDRO-DYNAMIC PRESS

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High pressures and short runs are typical requirements of modern aircraft production. To meet these needs during World War II, Bliss developed special rubber pad forming presses. Now pressure requirements are higher still. The Ford Motor Company's new Hydro-Dynamic press has *5000 tons capacity*. And it produces over 1000 different wing parts at Ford's Kansas City plant.

Here's how it works: While one die slide is in the press, blanks are set up or dies changed on the other three. Slides can then be fed to the press in any sequence; operators at each of the die slide tables can select any pressure required up to 5000 tons; and, of course, the rubber pad forming techniques keep tooling costs down.

Like this Ford installation, many Hydro-Dynamic presses are engineered for special-purpose use. But also available are standard Hydro-Dynamic presses designed to meet the more common production problems. Both types are described in Catalog 30-A which is yours for the asking.

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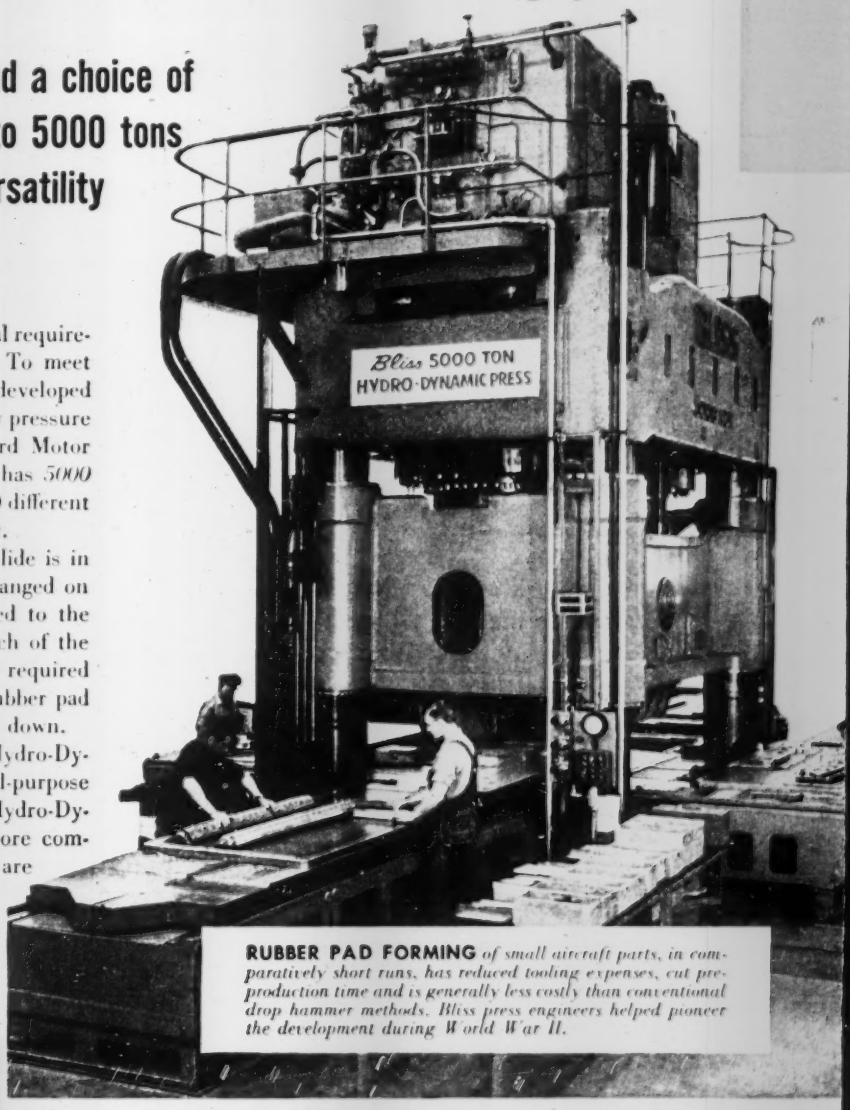

RUBBER PAD FORMING *of small aircraft parts, in comparatively short runs, has reduced tooling expenses, cut pre-production time and is generally less costly than conventional drop hammer methods. Bliss press engineers helped pioneer the development during World War II.*

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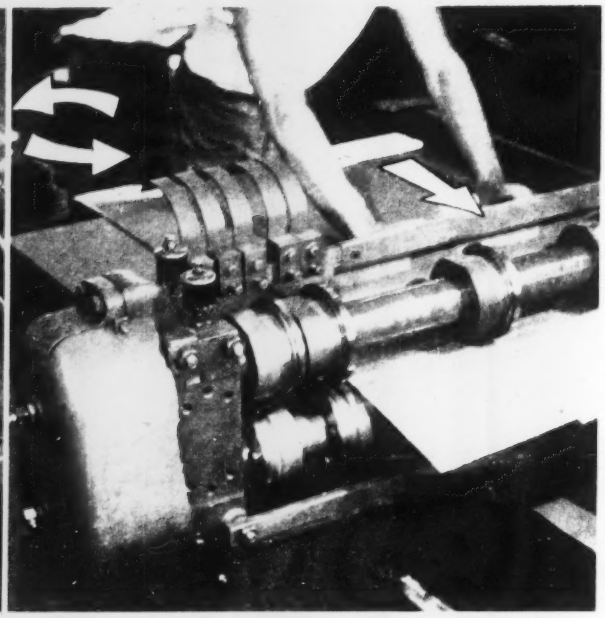
Arrows show chief motions in square shearing of tin can parts. Operator obtains stock, shears, stacks



Arrows show advantages of rotary slitter in this instance. Take-out operation, for example, was avoided

Charting Incentives for Job Shops

Case history illustrates that success of entire program often hinges upon the skill with which engineers perceive hidden pitfalls in one or a series of operations

By D. C. LATELLA
Management Consultant
D. C. Latella & Associates
Philadelphia

DEVELOPMENT of a sound incentive wage plan in a plant almost invariably requires a great deal of study and frequently reworking of the methods on which production standards are to be based.

Representative problems and ways in which they can be solved are illustrated in the case history of a job-type shop, George D. Ellis & Sons, Philadelphia, a producer of special types of tin cans and related products.

Although all but one of Ellisco's manufacturing departments are on standards now, the program had a conservative start in the slitting and shearing department, which formerly was on a straight time-work basis.

Department Setup—Slitting and shearing is the first stage of can manufacture. Tinplate sheets as received from the mill are cut to blank size for the can body, end and other attachments.

Department uses two types of equipment: Foot-operated, square shears and rotary slitters. Essentially two operations are performed by both: One cut to product circumference, and one cut to produce correct height for can bodies. Two similar cuts produce strip to feed into presses.

Problems—Some of the variables encountered in the development of standard data upon which payments to workers could be based: Range of production, for example, includes round can diameter from $1\frac{1}{16}$ to $17\frac{5}{8}$ inches; tinplate gages run from 0.010 to 0.036-inch; tempers from No. 1 to No. 4; materials involve hot dip and electrolytic tinplate, as well as cold rolled steel, stainless steel, brass aluminum, copper, Monel metal and several types of lead and zinc-coated sheets.

Flexibility of runs is the greatest variable. Average is from 5000 to 20,000 cans and may go as low as 50 or as high as 100,000.

Correct body patterns must be developed for each order. Each requires a fairly simple but precise setup of rotary slitters or square shears. On short runs, setup time represents a large portion

CHECKLIST OF DO'S AND DON'TS

If you think your specialty operations might lend themselves to an incentive system, proceed with care. Before you assign anyone to the job with stop-watch and slide rule, consider the following pointers:

DO determine exactly what you want your incentive system to accomplish.

DO survey your entire plant; don't limit thinking to one department or stage of production. You will have to proceed by departments, but have an over-all plan.

DO explain the plan carefully to foremen and supervisors well in advance. Their understanding is critically important.

DO keep your union (if you have one) and shop stewards informed of plans and progress.

DO watch for promising new supervisors among the workers as studies proceed. A workman respected by his fellows and who shows potential understanding of the new program is a diamond in the rough.

DON'T be impatient for results. Benefits will not be long in coming; careful preliminary study is worth the time it takes.

DON'T think incentives will be a substitute for good management. The system won't run itself.

DON'T try to persuade workers that it's all for their benefit. They're smart enough to know better. Explain frankly that the idea is to reduce costs, improve competitive position and permit higher earnings for above standard production. They'll appreciate your honesty.

DON'T assume that your operations are so different they preclude application of methods proved elsewhere. They might be, but probably aren't. An outsider is best equipped to prove this.

DON'T be surprised if studies reveal unexpected flaws in your present methods. It is to your advantage to know about them, even if you don't want to correct them now.

of total time while on long runs, say of 50,000 or more, supply of raw stock to operators of hand-fed equipment may reduce productive time.

Approach—Aim was to reduce each worker's non-productive time to a minimum. Only in this way could rates of payment be set high enough to interest them in attaining the benefits of an incentive bonus.

Solutions — After considerable study within the department and continuous consulation with plant management, operating methods were changed substantially. Some principal revisions are below:

Situation No. 1—Eighty per cent of the material was cut on square shears. Two-thirds of rotary slitter capacity was idle most of the time.

Change: About 60 per cent of the can bodies are now cut on rotary slitters. Square shears, about five times less efficient, are used only on heavy metal, extremely narrow blanks not suitable for rotary slitters or on short runs.

Results: About 100 per cent increase in productivity per man hour, better utilization of manpower and setup time shortened.

Situation No. 2—Almost every blank size cut was tested by the assembly of a sample can to check for correct finished dimensions.

Change: Preparation of tables of standard dimensions for all possible combinations of diameter and body height. Setup man merely checks shearing order to determine finished can dimensions and obtains correct blank size from chart.

Results: Tryouts were eliminated. Setups take about 20 per cent less time. Since jobs no longer wait for tryout results, scheduling is better. Uniformity on repeat orders for same product is improved.

Situation No. 3—Prior to cutting sheets into blanks, operator formerly squared sheet by making narrow initial cut to establish right angle.

Change: After sampling representative sheets from stock, it was proved that sheets as received are square to within required tolerances.

Result: One complete operation was eliminated, with a reduction of 10 to 50 per cent in hand shearing time with square shears.

Situation No. 4—One setup man handled all incoming orders, did all setup work and adjustment during operation and supervised work of semi-skilled shear hands.

Change: Shear hands trained to do all but most complicated setups, also trained to keep their own time and production reports. Setup man trained to check factory orders for accuracy.

Results: Former setup man now free for supervisory work; all equipment better and more regularly serviced; better utilization of manpower; and improved quality of product, since inspection and quality control are more consistent.

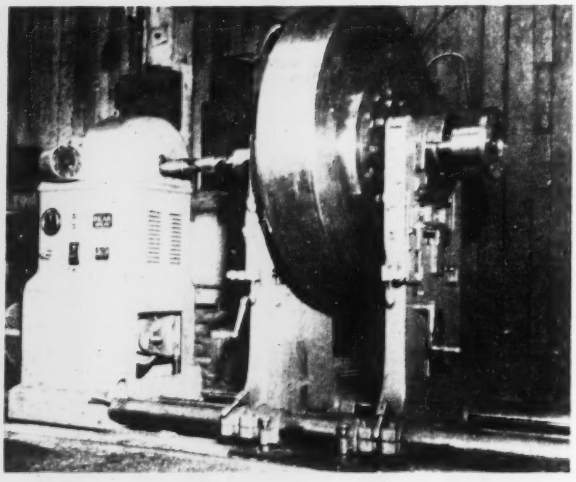
Payoff—Program was established successfully without the purchase of new slitting or shearing equipment. There were no costly or time consuming alterations in equipment or methods. No new employees were hired.

Shear hands were carefully trained and encouraged during the initial weeks of the installation. After a short period of skepticism, they cooperated actively with engineers and time-study men. Now they regularly exceed production standards by as much as 50 per cent.

Since slitting operations precede all others in the production sequence, improvements in methods were felt almost immediately in other departments. Shear hands relayed their approval of the system by word of mouth to men in other departments, easing the introduction of wage incentives elsewhere in the plant.

Concepts of incentives and production standards imply that there must be certain constants no matter how special the job. In the case described in this article, it simply took careful analysis to find and prove them.

Rough machining non-magnetic flywheel made of aluminum bronze. Here it's trimmed from 6300 to 4500 pounds



Ampco metal flywheel being brought to dynamic balance of within 2 ounce-inches at 300 rpm. OD is 49 inches

Centrifugal Casting . . .

SOLVES NON-MAGNETIC FLYWHEEL PROBLEM

Melt weight of 6300 pounds of aluminum bronze poured into mold spinning at several hundred rpm. After finish machining, only ounces of metal removed to meet specs

By R. J. SEVERSON
Manager Technical Sales
Ampco Metal Inc.
Milwaukee

SOLVING the problem of making a quantity of large, non-magnetic, inertia flywheels for Packard diesel engines that operate up to 2000 rpm required investigation of three production methods.

Originally, the manufacturer felt the answer could be found in forging or circle cutting from rolled plate, but long production lead times and high production costs eliminated both.

Orders were finally issued for centrifugal castings. Aluminum bronze, the material selected, has a nominal composition of Al, 10.5 per cent; Fe, 3.5 per cent; and Cu, balance.

Specifications — Ampco metal, grade 18, with proper heat treatment, meets required physical properties: Tensile strength, 90,000 psi, min.; yield strength (0.5 per cent elongation), 45,000 min.; elongation (percentage in 2 inches), 10 min.; and fatigue (100 million cycles), 35,000 psi, avg.

Structure has to be homogeneous and free of defects. Machined wheel must be brought to a dynamic balance of 2 ounce inches at 300 rpm. Another stipulation calls for proofing castings by spinning at 3150 rpm.

Further restriction, which is fulfilled with the material chosen, is that flywheels cannot include metals or other alloying elements in critical or short supply.

Production—In the finish machined condition, flywheels weigh about 4000 pounds. Physical dimensions are: OD, about 49 inches; bore diameter, 20 inches; and thickness, 11⅜ inches when measured at hub section and 9⅝ inches when measured through remainder of face.

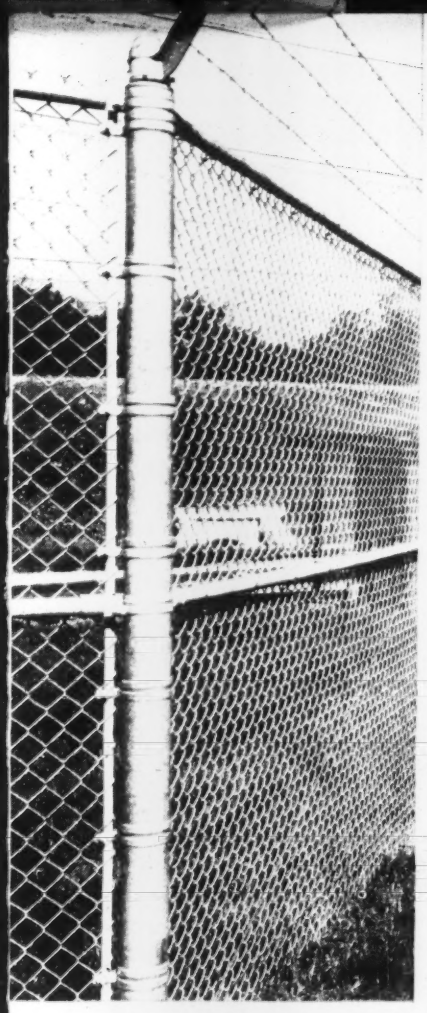
To produce this casting, a melt weight of 6300 pounds is poured into a steel mold, which revolves at several hundred revolutions per minute. After rough machining, casting weighs about 4500 pounds.

Soundness of production method is evidenced by the fact that after finish machining, it has been necessary to remove only 4 to 6 ounces of metal from each 4000-pound casting to meet the 2 ounce-inch balance requirement. There have been no failures at time of x-ray or during spinning, and physical properties exceed minimum requirements.

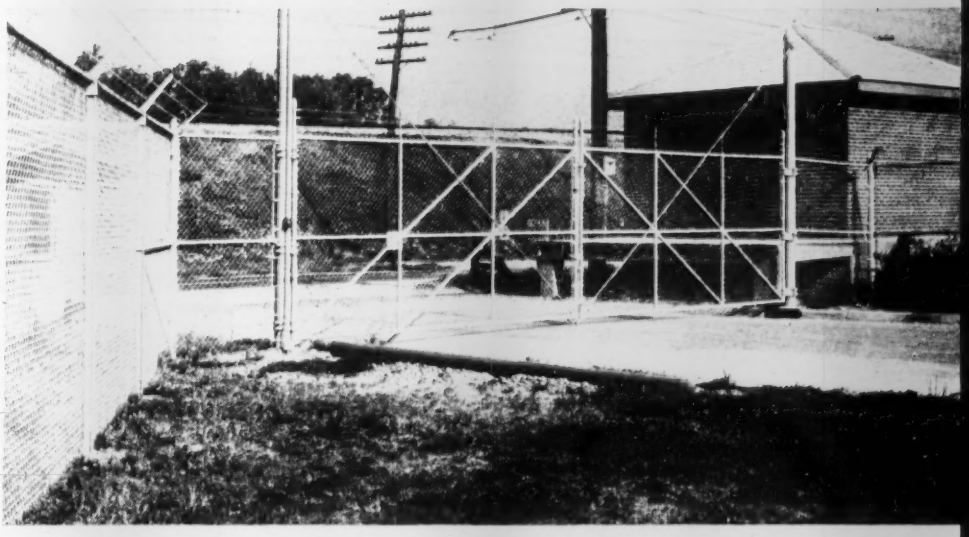
Testing, Heat Treating—After rough machining, casting is given a thorough ultrasonic inspection with a Sperry Reflectoscope.

Heat treating procedures follow conventional practice for the type of material involved: Water quench from elevated temperatures, followed by a stress relieving operation. Since it is possible for flaws to develop during heat treatment, a second ultrasonic inspection is specified.

As a final inspection before finish machining and spin testing, casting is x-rayed with a 22 million-volt, Allis-Chalmers betatron. Rough machined casting is then shipped to Berlin-Chapman Co., Berlin, Wis., which has equipment for close tolerance final machining, spin testing and balancing.



• Time To Stop Holding Uncontrolled "OPEN HOUSE"...



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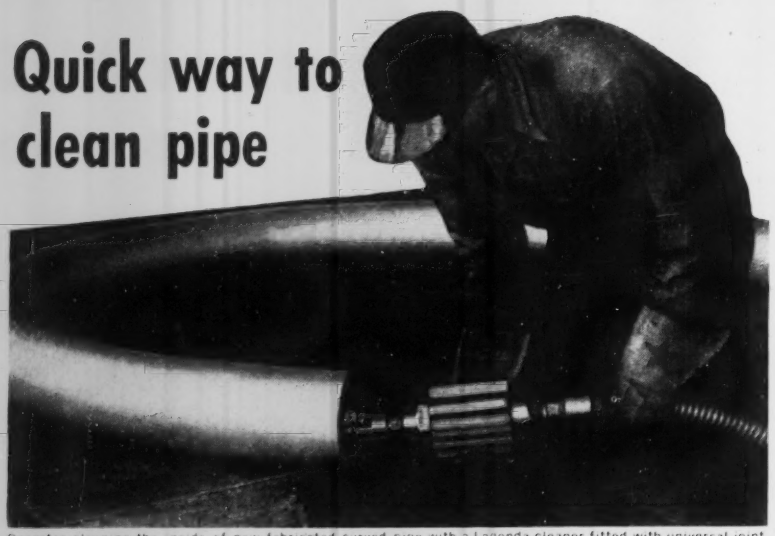
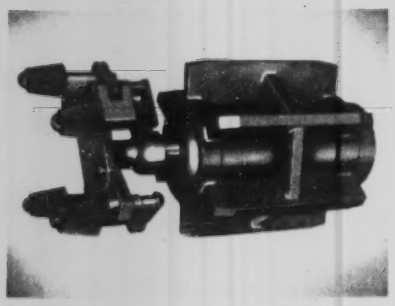
Quick way to clean pipe

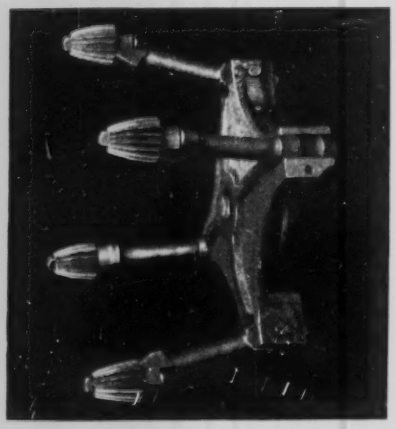


Operator cleaning the inside of new fabricated curved pipe with a Lagonda cleaner fitted with universal joint.

LAGONDA CLEANERS



Motor with sleeve for 10" straight pipe. For curved pipe a universal joint would be used between motor and cutter head.



One type of Lagonda cutter head for 18" pipe

take out rust, weld sputter, sand, mill scale, from pipe to 20" ID, straight or curved

The powerful air or steam driven Lagonda tube cleaner motor, with sleeve extension to fit the pipe diameter, is armed with a suitable Lagonda cutter head for a quick thorough job. The glass-hard cutters will not mar the inner pipe surface, but will shear and scrape off any protrusions or excess matter such as welding beads and mill scale. Also will remove every vestige of sand which has been packed into pipe for bending.

Lagonda pipe cleaners are widely used by pipe manufacturers and pipe fabricators. Particularly valuable in reconditioning used pipe.

For full details see your local Elliott representative or write to the Elliott Company, Springfield, Ohio for the tube cleaning Bulletin.

ELLIOTT Company

LAGONDA DIVISION

Y3 9

External Squeeze Testing

Strength tester for aluminum structures accommodates any size external shape

AIRPLANE jettisonable fuel tanks and other external stores components undergo a big squeeze at Pastushin Aviation Corp., Los Angeles, when the sleek aluminum structures are tested for strength on a static test stand developed by the aviation firm's research and development engineering staff.

The test stand consists of a strong welded and bolted structural frame which supports the structure to be tested, a hydraulic system to generate the load, a series of load straps which apply the loads, and dynamometer rings to read the loads. Adjustable to accommodate testing of any size external fuel tank or streamlined shape, the structural frame allows the component to be mounted for test in the same position, and to use the same attach fittings as on the airplane.

Applied Loads—Results of horizontal and vertical inertia and aerodynamic loads resulting from flight maneuvers are distributed over the length of the test article by flexible load straps. Applied loads are read at two airload and ten inertia load application points by calibrated steel dynamometer rings, each of 5000 pounds capacity.

The hydraulic system consists of a battery operated hydraulic pump and hydraulic struts and valves to control each strut. The struts apply the loads to the straps and are linked by flexible hydraulic lines to a mobile cart containing the hydraulic control panel, and the motor and pump unit.

20-Ton Capacity — Pastushin's current tank test programs are for sonic and trans-sonic flight conditions resulting in applied loads up to 8 to 16 tons with corresponding skin area loads up to 1600 pounds per sq ft.

However, the manufacturer's engineers say the stand has a wide range of flexibility and can static-test components of super-sonic military aircraft under total applied loads of as much as 20 tons.

Conveying Dust by Air

DUST RECOVERED by Cottrell precipitators in the roasting of metallic sulphides is returned to roasting furnaces for reprocessing at temperatures of from 500 to 800 F by a special pneumatic conveying system at Noranda Smelter, Noranda, Quebec. By returning the dust to the furnaces while hot, a more efficient roaster operation is effected.

Dust is gravity-fed from a hopper into a Fuller-Kinyon pump. A screw element of the pump feeds the dust into an air-mixing chamber in which it is made fluent by compressed air. From the mixing chamber, compressed air at 15 psi delivers the dust, through a conveying line, to a supply bin located above the roasters.

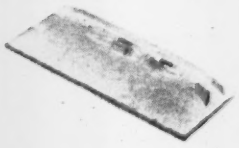
Airslide—Dust is fed uniformly from the supply bin to ten roasters by means of an enclosed inclined porous medium (in this case refractory aluminum oxide) which supports the stream of dust. The dust is sufficiently fluidized by low-pressure air passing through the aluminum oxide that gravity causes it to flow.

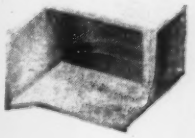
A special feature of this installation is the use of a refractory (aluminum oxide) as the porous medium. For most applications at normal temperatures—such as conveying cement, gypsum, soda ash, iron ore and lime—a fabric is used for this purpose.

Machine Is Peak Performer

Two-station hydraulic-feed horizontal transfer machine is being used for core drilling and semifinish boring on camshaft bearings, as well as for drilling various other holes in both ends of cylinder blocks. It produces 75 blocks an hour at 100 per cent efficiency in this automotive application.

Designed and built by Peerless Production Co., Detroit, machine utilizes unitized transfer sections and hydraulic feed units. Other typical features include: Fixed-center ball-bearing heads with oil circulating pump for lubrication; hardened and ground way-type units with automatic lubrication; and electrical hydraulic installations to J.I.C. standards.





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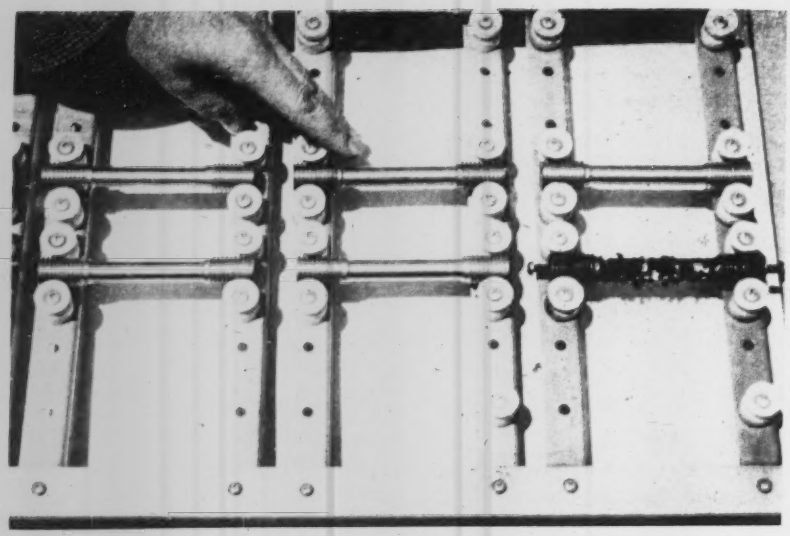
Dept. 19, 12800 Shaker Boulevard Cleveland 20, Ohio



Metals in Action

Type 430 stainless steel is a hardy civilian. Visual evidence is offered by samples of bar stock exposed for 5½ years in mild industrial atmosphere at Armco Steel Corp.'s corrosion yard, Middletown, O. Top left, type 302; bottom left, type 304; top center, type 410; bottom center, type 430; top right, type 430F; bottom right, chromium-plated mild steel. In an article appearing in STEEL, Sept. 28, 1953, p. 89, this photo was inadvertently turned, giving erroneous impression that type 304 stainless has poor corrosion resistance

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Chatterless Machining

CEMENTED tungsten carbide is known in metalworking for cost savings in tooling and wear resistant applications. Today it's finding some additional uses, such as solid cores within boring bars to eliminate chatter during machining.

A case in point is one company's experience in machining a job requiring a bore 1.250 inches in diameter, 5½ inches long, in SAE 1010 steel. Operating on this job in a consulting capacity, Ex-Cell-O Corp.'s engineering department recommended to eliminate chatter use of a boring bar or quill containing a solid tungsten carbide core. Kennametal grade K-6 produced excellent results due to its high Young's modulus of elasticity—94.3 million psi.

Suitable Depth — Boring quill was bored from the flange end to a depth suitable for the tool slot and length of solid tungsten carbide tool. In similar applications in industry the depth will vary depending on length of quill and amount of material needed at the quill's nose for a tool slot. In this particular Ex-Cell-O application, the quill had a 30-degree tool slot and required an axial thickness of 1 inch at the nose.

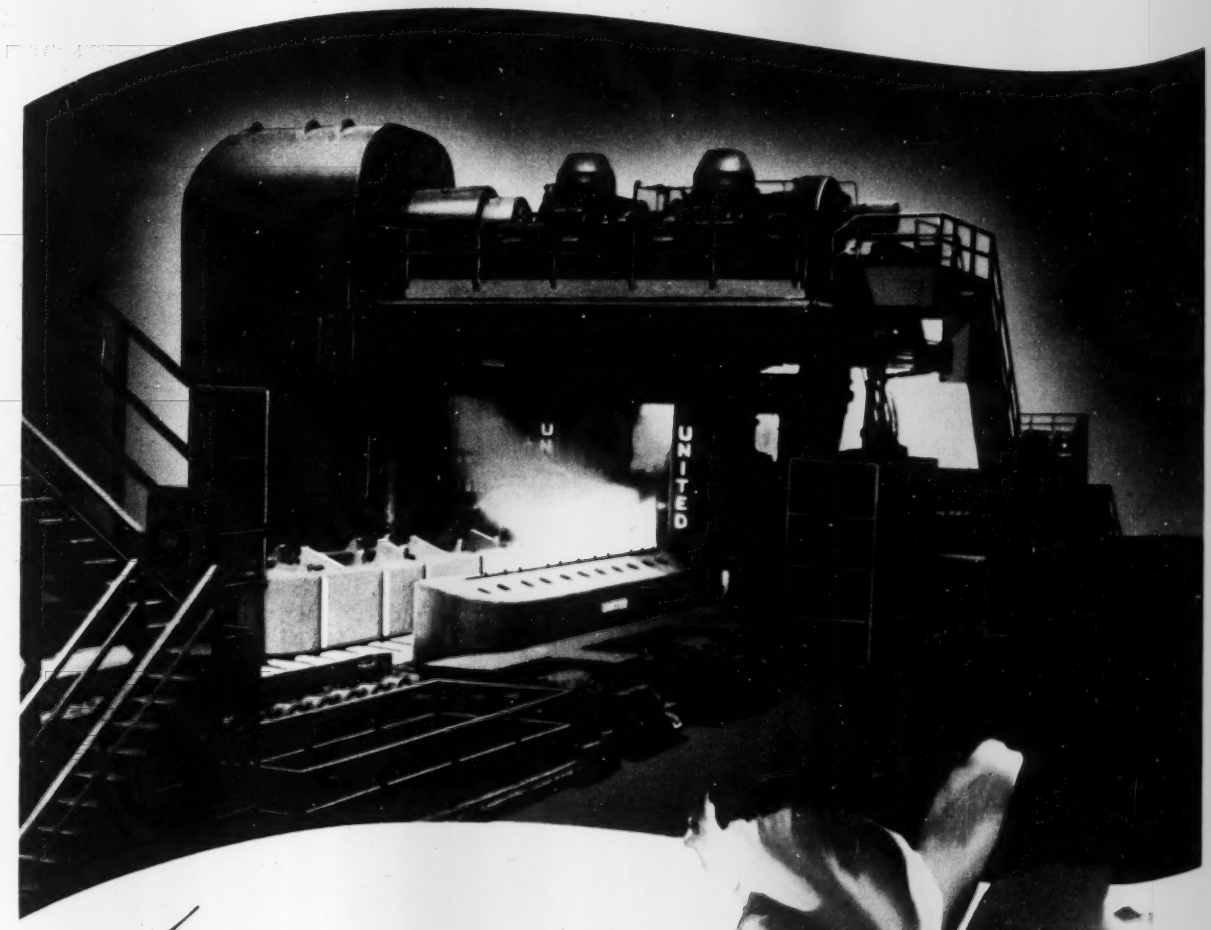
Enough stock was left in the bore to permit a shrink fit on the solid carbide core, which in this case was 13/16-inch in diameter by 6½ inches long, extending to the back face of the flange.

No Chatter — When this new quill was put into use all chatter was eliminated. Different feeds and speeds were tried but still no chatter occurred. Following this successful application, the company applied the same principle to three other bars of a similar size, and all proved successful.

Cap Screw Pamphlet

A pamphlet containing latest American standards for hexagon head and slotted head cap screws has been published by United States Cap Screw Service Bureau, 53 Park Place, New York 7, N. Y.

Copies of these standards pamphlets may be obtained without charge by sending a letter or postal card to the above address.



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Electrical Sheets
Alloy Sheets
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

CORPORATION

NEWPORT, KENTUCKY

STEEL
November 23, 1953

Market Outlook

MORE steel producing facilities are idle now for lack of business than in any strike-free or holiday-free week since the summer of 1949.

On the idle list is something more than 10 per cent of the nation's ingotmaking capacity, plus related equipment.

TRIMMED DOWN— The continuing increase in unemployed facilities dropped production of steel for ingots and castings down to 90.5 per cent of capacity in the week ended Nov. 21, fourth consecutive week of decline. This is a 2-point reduction from the preceding week.

While the latest rate of steel ingot production would lead one to believe only 9.5 per cent of theoretical capacity is idle, the percentage is actually higher, for the production rate is calculated on the Jan. 1, 1953, capacity of 117.5-million net tons. Since then, some additional capacity has come into being.

STILL IMPRESSIVE— Even though an increasing amount of capacity is being idled, the substantial expansion in capacity over the last few years leaves enough capacity in use to turn out 2,040,000 net tons of steel for ingots and castings a week at a production rate of 90.5 per cent. In only the last three years has the steel industry had enough capacity to make as much as 2 million tons a week.

VACATIONING— Partly reflecting the reduced rate of steel buying and steel production, iron ore boats began tying up earlier for the winter this year than in any year for a long time. Also hastening the tie-ups is the increase in fleet's carrying capacity; the boats were able to get their jobs done early, particularly in a year when demand for iron and steel is shrinking.

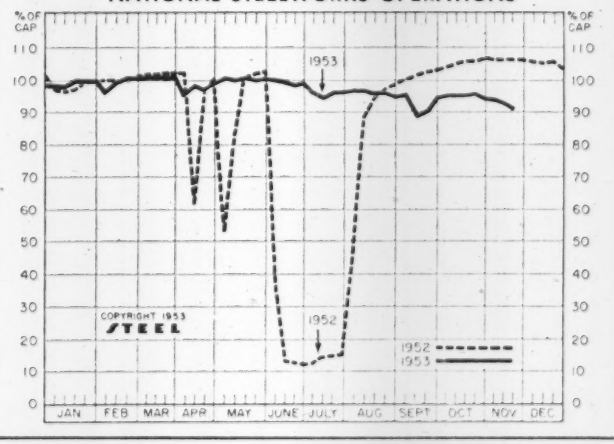
MORE FURNACES IDLE— The boats began tying up when it was apparent the number of idle blast furnaces was increasing. On Nov. 1, 18 of the 191 blast furnaces in the U. S. were idle, compared with 11 on Sept. 1. Blast furnaces were taken out of production not only because of the steelmakers' reduced needs for iron but also because of the prolonged lull in business at foundries, another important segment of iron users.

While some steel producers have keenly felt the reduction in steel buying, the decline in the national rate of steel production is thus far not considered to be alarming. Almost everyone expected the drop.

ADJUSTMENT COMPLETED?— Much of the reduced rate of steel buying is attributed to a downward correction in inventories. When steel users knew demand was less than supply, they were inspired to lower their steel stocks to the lowest practical level. In many cases inventory adjustments have been completed.

LOOKING AHEAD— Although steel demand is currently lower than it was, the long-range predictions for the steel industry radiate an optimism. A large number of economists agree that industrial production in 1954 should not fall much more than 5 per cent below the 1953 level. That should keep steel demand at a high level. Looking not only at 1954 but beyond, Leslie B. Worthington, president of U. S. Steel Supply Division, U. S. Steel Corp., says, "From the standpoint of number of customers, the market is better than it ever has been. We are smack in the middle of a population boom that shows no signs of simmering down."

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Nov. 21	Change	Same Week 1952	Same Week 1951
Pittsburgh	86	— 2.5*	105	103
Chicago	58	0*	113.5	106.5
Mid-Atlantic	90	— 4	101	101
Youngstown	96	0	106	106
Wheeling	98	— 1	100.5	99
Cleveland	99.5	+ 1	112.5	104
Buffalo	100	— 6.5	106.5	104
Birmingham	96.5	0	106	100
New England	85	0	85	90
Cincinnati	59.5	— 8.5	90	103
St. Louis	90	+ 1	86	91.5
Detroit	97.5	0	106	101.5
Western	94	— 6	104	102
Estimated National Rate	90.5	— 2	106	103

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 35 Technical Outlook—p. 83

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Nov. 17

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$8.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.013	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193	‡Not available.	
Bars, tool steel, H.R. alloy, high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.250				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Nov. 17 1953	Nov. 10 1953	Month Ago	Oct. Average
(1947-1949=100)	141.5	141.5	141.5	141.5

STEEL'S FINISHED STEEL PRICE INDEX

	Nov. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	151.86
Index in cents per lb.	5.130	5.130	5.130	4.912	4.114

STEEL'S ARITHMETICAL PRICE COMPOSITE*

	Nov. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.18	$115.18	$115.41	$110.98	$95.05
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	35.00	35.33	32.83	43.00	43.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Nov. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, del., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.225	3.50
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝", Pitts.	4.525	4.525	4.525	4.325	3.775

PIG IRON, Gross Ton	Nov. 19 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$36.50	$37.50	$36.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	35.00	35.00	31.50	41.50	45.25
No. 1 Heavy Melt, Chicago	33.50	33.50	30.50	42.50	41.75
No. 1 Heavy Melt, Valley	35.50	35.50	34.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	33.50	33.50	31.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	34.50	34.50	34.50	43.00	48.50
Rails, Rerolling, Chicago	46.50	45.00	42.50	52.50	66.50
No. 1 Cast, Chicago	34.50	34.50	32.50	46.00	70.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry., Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.125 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Nov. 19	Change	Previous Price	Oct. Avg.	Sept. Avg.	Nov. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.606	29.500	24.500
Lead	13.30	Sept. 16	13.80	13.300	13.540	13.965
Zinc	10.09	Sept. 11	10.50	10.000	10.180	12.500
Tin	83.00	Nov. 19	83.50	81.096	82.410	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $186-$189 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots, for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz. nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $12.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 83.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Prime western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.00; No. 12 foundry alloy (No. 2 grade) 20.25-21.25; 5% silicon alloy, 0.60 Cu max., 23.00-24.00; 13 alloy, 0.60 Cu max., 23.00-24.00; 195 alloy 22.00-22.75; 108 alloy 21.00-21.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 17.50-18.50.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof 100,000 lb 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
48-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$15.05	2	$46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	26.250
Yellow brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 11.00, mixed clippings 10.00; old sheet 10.00; borings and turnings 6.50-7.00; pistons and struts 7.00; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 23.50; No. 2 copper 21.50; light copper 18.50-19.00; No. 1 composition red brass 17.00-17.25; No. 1 composition turnings 16.25-16.75; mixed brass turnings 11.00; new brass clippings 18.00; No. 1 brass rod turnings 13.00; light brass 10.25-10.50; heavy yellow brass 12.50-13.00; new brass rod ends 15.00; auto radiators, unsweated 13.00; cocks and faucets 14.50-15.00; brass pipe 16.25-16.50.

Lead: Heavy 10.00-10.50; battery plate 5.50-5.75; linotype and stereotype 12.00; electrotype 10.75; mixed babbitt 12.25.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 18.00-20.00; rods 24.00-26.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S 3S clippings 15.00-15.50; 51S, 52S clippings 15.00-15.50; 14S, 17S, 24S, clippings 14.00-14.50; mixed clippings 13.75-14.25; old sheet 11.75-12.75; old cast 11.75-12.75; clean old cable, free of steel 15.00-15.50; borings and turnings 12.25-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.00; light copper 21.50; refinery brass (60% copper) per dry copper content 19.50; auto radiators 13.25 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.50; light copper 22.00; No. 1 composition borings 17.00-18.00; No. 1 composition solids 17.50-18.50; heavy yellow brass solids 13.50-14.00; yellow brass turnings 12.50-12.75; radiators 13.50-14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.18 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.75, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb 99.5; 200-499 lb 98; 500-999 lb 97.5; 1000 lb or more 97.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 65.2; 100-600 lb 51.4; 700-1900 lb 48.9; 2000-9200 lb 47.1; 10,000 lb or more 46.

Stannous Chloride (Anhydrous): Less than 50 lb $1.407; 50 lb $1.157; 100-300 lb $1.007; 400-900 lb 98.2; 1000-1900 lb 95.4; 2000-4900 lb 92.1; 5000-19,000 lb 86; 20,000 lb and over 79.9.

Stannous Sulphate: Less than 50 lb $1.20; 50 lb 90; 100-1900 lb 88; 2000 lb and over 85.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Aluminum supply catches up with demand. From here on, competition within the aluminum industry and with other metals will be increasingly sharp

HAMMERING AWAY at a chronic undersupply situation that has kept buyers waiting in line since Korea, the nation's aluminum industry has finally evened the supply-demand scales.

Much ballyhooed in expectancy but little noted in occurrence, the catch-up is significant. From here on, competition within the industry and with other metals will be fierce.

Completion of present expansions will find aluminum capacity expanded ten-fold since 1939. Producers, distributors and fabricators will be digging to consolidate newly won gains and capitalize on development opportunities.

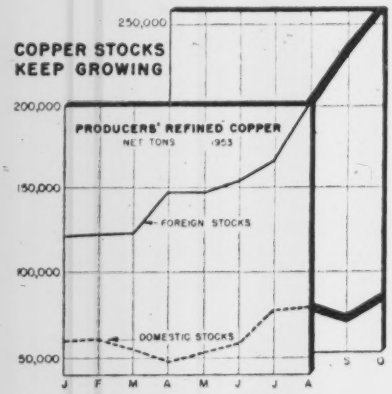
Quick Delivery—Buyers of the light metal will tell you they are having little trouble in placing orders today. Aluminum mills have open capacity in December on most products, caused chiefly by cancellations or deferrals of long-standing orders. The market is generally softer than most people would like to believe, with short work weeks or actual layoffs quietly effected around the industry.

Pressure on government to keep competition from abroad in hand has risen noticeably. A clarification has been asked on Buy American Act provisions as applied to purchases of aluminum sheet and plate for defense uses. Secondary smelters, on the other hand, want tighter regulation of export permits. Too much metal is going abroad for them to maintain adequate supplies, they claim.

Stringent Specs—Temporary lowering of specifications on aluminum going into the national stockpile is also being asked. Industry says stockpile specs are more stringent than is necessary for military alloys. The high-purity metal wanted by the government is also in greatest commercial demand.

The problem for aluminum producers is high iron content metal that comes from electrolytic cells for about three months after operations begin. Advent of larger cells, or pots, could be a factor extending this break-in period.

Records Fall—To an industry that has shot into the No. 2 spot in production tonnage, new records are commonplace. Shipments of aluminum materials this year will top 1952 by some 350,000 tons and hit an all-time high of 1.7 million tons, estimates Business & Defense Services Administration. Shipments for military programs are expected to be slightly less than those of 1952 though. BDSA expects U. S. primary output this year to hit 1.25 million tons and that production losses this winter from power shortages will be less severe than last year.



Source: Copper Institute.

First-quarter setasides for defense and AEC uses have been cut by 20,500 tons from fourth quarter to a total of 97,000 tons. That's about 24 per cent of estimated supply and compares with 29 per cent of available supply in the fourth quarter.

DMB Review—The seemingly endless stalemate on third-round expansion in primary aluminum continues as review last week by Defense Mobilization Board was canceled. Olin Industries' chances are still considered good. President Eisenhower's friendly gestures towards Canada brighten prospects of continued imports from the north, though a long-term contract seems to have little chance of going through.

Looking to the Future

Mid-Century Conference on Resources for the Future, scheduled to get under way next month in Washington, could have an important bearing on the long-term future of metals production. A nongovernmental organization composed of prominent men of science, industry, education and agriculture, it will explore projected national requirements and means of mobilizing resources to fill them.

Participants in the conference session on domestic problems of nonfuel minerals are expected to bring up revision of mining laws to aid exploration, tax incentives to mine development and improvement in mine technology and metals use.

Balanced Market for Lead

Lead consumption will continue in future months at about 1.1 million tons a year, C. R. Ince, vice president, St. Joseph Lead Co., told batterymakers meeting in Chicago last week. A balanced market with no large price fluctuations either way is expected, he said, chiefly because the peak of imports is past. "Current price of 13.50 cents, New York, is fairly secure and could even improve," he noted.

Consumption of lead today is at an all-time high of about 1.2 million tons. Future supplies will come chiefly from secondary lead, Mr. Ince says. Remelt lead will account for 475,000 tons and domestic mine output about 300,000 tons, leaving us dependent on about 325,000 tons from abroad.

Copper: Unchanged Story

Copper picture continues little changed. Buyers express a growing realization that waiting for lower prices will be futile until the interminable political negotiations are resolved. The market changed little statistically in October. Copper Institute figures show U. S. refined output up 11,000 tons to 126,138 tons. Deliveries to fabricators registered 110,519 tons, a gain of 6000 tons. Refined stocks going into November rose 11,396 tons to 84,303 tons.

Nonferrous Briefs

- Light metals get a big boost in Ordnance Corps "Bulletin 23-53," issued last month. "Greater use of aluminum, magnesium, titanium and high-strength steels must be made where increased combat effectiveness justifies the increased cost," the bulletin suggests.

- World production of platinum metals—platinum, palladium, iridium, rhodium, ruthenium and osmium—could fit in a 43-inch cube, Franklin Institute points out. Total production is about 23 tons, valued roughly at $50 million. U. S. industry uses about 456,000 troy ounces of platinum metals yearly, chiefly in chemical and electrical fields.

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 133. Key to footnotes, page 135.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)

Fontana,Calif. K1	$ 6.00
Munhall,Pa. U5	5.00

INGOTS, Alloy (NT)

Detroit R7	$63.00
Fontana,Calif. K1	62.00
Midland,Pa. C18	62.00
Munhall,Pa. U5	62.00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)

Aliquippa,Pa. J5	$62.00
Bessemer,Ala. T2	62.00
Clairton,Pa. U5	62.00
Fontana,Calif. K1	62.00
Fairfield,Ala. T2	62.00
Fontana,Calif. K1	*70.00*
Gary,Ind. U5	62.00
Johnstown,Pa. B2	62.00
Lackawanna,N.Y. B2	62.00
Munhall,Pa. U5	62.00
So.Chicago,Ill. U5	62.00
So.Duquesne,Pa. U5	62.00

Carbon, Forging (NT)

Aliquippa,Pa. J5	$75.50
Bessemer,Pa. U5	75.50
Buffalo R2	75.50
Canton,O. R2	75.50
Clairton,Pa. U5	75.50
Cleveland R2	75.50
Conshohocken,Pa. A3	82.50
Detroit R7	78.50
Kisley,Ala. T2	75.50
Fairfield,Ala. T2	75.50
Fontana,Calif. K1	*81.50*
Gary,Ind. U5	75.50
Geneva,Utah C11	75.50
Houston,Pa. S5	80.50
Johnstown,Pa. B2	75.50
Lackawanna,N.Y. B2	75.50
LosAngeles B3	94.50
Munhall,Pa. U5	75.50
Seattle B3	94.50
So.Chicago,Ill. R2,U5,W14	75.50
So.Duquesne,Pa. U5	75.50
So.SanFrancisco B3	94.50

Alloy, Forging (NT)

Bethlehem,Pa. B2	$82.00
Buffalo R2	82.00
Canton,O. R2,T7	82.00
Conshohocken,Pa. A3	89.00
Detroit R7	84.00
Fontana,Calif. K1	101.00
Gary,Ind. U5	82.00
Houston,Pa. S5	92.00
Ind.Harbor,Ind. Y1	82.00
Johnstown,Pa. B2	82.00
Lackawanna,N.Y. B2	82.00
LosAngeles B3	102.00
Massillon,O. R2	82.00
Midland,Pa. C18	82.00
Munhall,Pa. U5	82.00
So.Chicago,Ill. R2,U5,W14	82.00
So.Duquesne,Pa. U5	82.00
Struthers,O. Y1	82.00
Warren,O. C17	82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$92.50
Canton,O. R2	92.50
Cleveland R2	92.50
Fontana,Calif. K1	113.50
Gary,Ind. U5	92.50
Massillon,O. R2	92.50
So.Chicago,Ill. R2	92.50
So.Duquesne,Pa. U5	92.50

SHEET BAR (NT)

Fontana,Calif. K1	$93.18

SKELP

Aliquippa,Pa. J5	3.85
Munhall,Pa. U5	3.75
Warren,O. R2	3.75
Youngstown R2, U5	3.75

WIRE RODS

AlabamaCity,Ala. R2	4.525
Aliquippa,Pa. J5	4.525
Alton,Ill. L1	4.70
Buffalo W12	4.525
Cleveland A7	4.525
Donora,Pa. A7	4.525
Fairfield,Ala. T2	4.525
Fontana,Calif. K1	5.325
Houston,Pa. S5	4.925
Johnstown,Pa. B2	4.525
Joliet,Ill. A7	4.525
KansasCity,Mo. S5	4.85
LosAngeles B3	5.325
Minnequa,Colo. C10	4.775
Monessen,Pa. P7	4.725
No.Tonawanda,N.Y. B11	4.525
Pittsburg,Calif. C11	5.175
Portsmouth,O. P12	4.525
Rodney,N.J. R5	4.625
So.Chicago,Ill. R2	4.525
Sparrows Pt.,Md. B2	4.625
Sterling,Ill.(1) N15	4.525
Struthers,O. Y1	4.525
Torrance,Calif. C11	4.525
Worcester,Mass. A7	4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Bessemer,Ala. T2	4.10
Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fontana,Calif. K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
Houston,Pa. S5	4.60
Ind.Harbor,Ind. I-2	4.10
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.80
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.80
Minnequa,Colo. C10	4.60
Munhall,Pa. U5	4.10
Niles,Calif.(22) P1	4.90
Phoenixville,Pa. P4	4.70
Seattle B3	4.85
So.Chicago,Ill. U5,W14	4.10
So.SanFrancisco B3	4.75
Torrance,Calif. C11	4.80
Weirton,W.Va. W6	4.85

Wide Flange

Bethlehem,Pa. B2	4.15
Clairton,Pa. U5	4.10
Fontana,Calif. K1	5.50
Lackawanna,N.Y. B2	4.15
Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

Alloy Stand. Shapes

Clairton,Pa. U5	5.00
Fontana,Calif. K1	6.40
Gary,Ind. U5	5.00
Munhall,Pa. U5	5.00
So.Chicago,Ill. U5	5.00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	6.175
Bessemer,Ala. T2	6.175
Bethlehem,Pa. B2	6.20
Clairton,Pa. U5	6.175
Fairfield,Ala. T2	6.175
Fontana,Calif. K1	6.825
Gary,Ind. U5	6.175
Geneva,Utah C11	6.175
Ind.Harbor,Ind. I-2	6.175
Ind.Harbor,Ind. Y1	6.675
Johnstown,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
LosAngeles B3	6.85
Munhall,Pa. U5	6.175
Seattle B3	6.90
So.Chicago,Ill. U5,W14	6.175
So.SanFrancisco B3	6.80
Struthers,O. Y1	6.675

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.20
Lackawanna,N.Y. B2	6.20
Munhall,Pa. U5	6.125
So.Chicago,Ill. U5	6.125

BEARING PILES

Munhall,Pa. U5	4.10
So.Chicago,Ill. U5	4.10

—PILING—

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Munhall,Pa. U5	4.925
So.Chicago,Ill. U5	4.925

—PLATES—

PLATES, Carbon Steel

AlabamaCity,Ala. R2	4.10
Aliquippa,Pa. J5	4.10
Ashland,Ky. (15) A10	4.10
Bessemer,Ala. T2	4.10
Clairton,Pa. U5	4.10
Cleveland,O. R2	4.10
Coatesville,Pa. L7	4.35
Conshohocken,Pa. A3	4.25
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Fontana,Calif.(30) K1	4.75
Gary,Ind. U5	4.10
Geneva,Utah C11	4.10
GraniteCity,Ill. G1	4.30
Harrisburg,Pa. C8	*7.10*
Houston,Pa. S5	4.60
Ind.Harbor,Ind. I-2, Y1	4.10
Johnstown,Pa. B2	4.10
Lackawanna,N.Y. B2	4.10
Minnequa,Colo. C10	4.05
Munhall,Pa. U5	4.10
Pittsburg,Calif. C11	4.85
Sharon,Pa. S3	4.10
So.Chicago,Ill. U5, W14	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown,O. U5, Y1	4.10

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	5.00
Geneva,Utah C11	5.25

PLATES, Wrought Iron

Economy,Pa. B11	9.30

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	6.25
Bessemer,Ala. T2	6.25
Clairton,Pa. U5	6.25
Cleveland,O.	6.25
Conshohocken,Pa. A3	6.25
Ecorse,Mich. G5	6.45
Fairfield,Ala. T2	6.25
Fontana,Calif.(30) K1	6.95
Gary,Ind. U5	6.25
Geneva,Utah C11	6.25
Ind.Harbor,Ind. I-2	6.25
Ind.Harbor,Ind. Y1	6.75
Johnstown,Pa. B2	6.25
Lackawanna,N.Y. B2	6.25
Munhall,Pa. U5	6.25
Pittsburgh,Pa. P2	6.25
Seattle B3	7.15
Sharon,Pa. S3	6.25
So.Chicago,Ill. U5, W14	6.25
SparrowsPoint,Md. B2	6.25
Youngstown,O. U5	6.25
Youngstown Y1	6.75

PLATES, Alloy

Claymont,Del. C22	5.65
Coatesville,Pa. L7	5.75
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.50
Johnstown,Pa. B2	5.50
Munhall,Pa. U5	5.50
Sharon,Pa. S3	5.50
So.Chicago,Ill. U5, W14	5.50
SparrowsPoint,Md. B2	5.50

FLOOR PLATES

Cleveland,O.	5.15
Conshohocken,Pa. A3	5.15
Ind.Harbor,Ind. I-2	5.15
Munhall,Pa. U5	5.15
So.Chicago,Ill. U5	5.15

PLATES, Ingot Iron

Ashland,Ky.(15) A10	4.35
Ashland,Ky.(15) A10	4.55
Cleveland,O. R2	4.70
Warren,O. R2	4.70

—BARS—

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2	4.15
Aliquippa,Pa. J5	4.15
Alton,Ill. L1	4.35
Atlanta,Ga. A11	4.40
Bessemer,Ala. T2	4.15
Buffalo R2	4.15
Canton,O. R2	4.15
Clairton,Pa. U5	4.15
Cleveland R2	4.15
Detroit R7	4.30
Ecorse,Mich. G5	4.35
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston,Pa. S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.05
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh,Pa. P2	4.15
SandSprings,Okla. S6	4.85
Seattle B3, N14	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill. (1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown R2, U5	4.15

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	5.20
BeaverFalls,Pa. M12, R2	5.20
Buffalo R4	5.25
Camden,N.J. P13	5.65
Carnegie,Pa. C12	5.20
Chicago W18	5.20
Cleveland A7, C20	5.20
Detroit P17, R7	5.35
Detroit B5	5.40
Donora,Pa. A7	5.20
Elyria,O. W8	5.20
Franklin Park,Ill. N5	5.20
Gary,Ind. R2	5.20
GreenBay,Wis. F7	5.20
Hammond,Ind. I-2, M13	5.20
Hartford,Conn. R2	5.75
Harvey,Ill. B4	5.25
LosAngeles R2	6.65
Mansfield,Mass. B5	5.75
Massillon,O. R2, R8	5.20
Monaca,Pa. S17	5.20
Newark,N.J. W18	5.65
NewCastle,Pa. (17) B4	5.20
Pittsburgh,Pa.	5.20
Plymouth,Mich. P6	5.45
Putnam,Conn. W18	5.75
Readville,Mass. C14	5.75
St.Louis,Mo. M4	5.50
So.Chicago,Ill. W14	5.20
SpringCity,Pa. K3	5.65
Struthers,O. Y1	5.20
Waukegan,Ill. A7	5.20
Worcester,Mass. W19	6.10
Youngstown R3, Y1	5.20

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md. G1	C19 4.45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	6.325
BeaverFalls,Pa. M12	6.325
Bethlehem,Pa. B2	6.325
Buffalo B5	6.325
Camden,N.J. P13	6.50
Canton,O. R2, T7	6.325
Carnegie,Pa. C12	6.325
Chicago W18	6.325
Cleveland A7, C20	6.325
Detroit P17	6.325
Detroit R7	6.325
Detroit B5	6.425
Donora,Pa. A7	6.325
Elyria,O. W8	6.325
Gary,Ind. R2	6.325
GreenBay,Wis. F7	6.325
Hammond,Ind. I-2, M13	6.325
Hartford,Conn. R2	6.775
Harvey,Ill. B5	6.325
Lackawanna,N.Y. B2	6.325
Mansfield,Mass. B5	6.775
Massillon,O. R2, R8	6.325
Midland,Pa. C18	6.325
Monaca,Pa. S17	6.325
Newark,N.J. W18	6.65
Plymouth,Mich. P6	6.525
So.Chicago,Ill. R2, W14	6.325
SpringCity,Pa. K3	6.475
Struthers,O. Y1	6.325
Warren,O. C17	6.325
Waukegan,Ill. A7	6.325
Worcester,Mass. A7	6.625
Youngstown,O. Y1	6.325

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	4.15
Atlanta A11	4.40
Buffalo R2	4.15
Cleveland R2	4.15
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston,S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh,Pa. P2	4.15
SandSprings,Okla. S6	5.05
Seattle B3, N14	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill. (1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown R2, U5	4.15

BARS, Reinforcing (Fabricated, to consumers)

Johnstown, ½-1" B2	5.55
KansasCity S5	6.35
LosAngeles B3	6.18
Marion,O. P11	5.55
Seattle N14	5.80
Seattle B3	6.25
So.SanFrancisco B3	6.25
SparrowsPt. ½-1" B2	5.55
Williamsport,Pa. S19	5.45

RAIL STEEL BARS

Ayis,Pa.(4) C18	4.75
ChicagoHts.(3) C2	4.50
ChicagoHts.(4) C2	4.75
ChicagoHts.(3,4) I-2	4.50
FortWorth,Tex.(26) T4	4.65
Franklin,Pa.(3) F5	4.50
Franklin,Pa.(4) F5	4.75
Marion,O.(3) P11	4.50
Moline,Ill.(3) R2	4.50
Tonawanda(3,4) B12	5.00
Williamsport,Pa.(3) S19	5.25
Williamsport,Pa.(4) S19	5.45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.40
Economy,Pa.(D.R.) B14	12.90
Economy(Staybolt) B14	13.20
M.K.Rks.(Staybolt) L5	15.50
M.K.Rks.(S.R.) L5	10.40
M.K.Rks.(D.R.) L5	14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2	3.925
Allenport,Pa. P7	3.925
Ashland,Ky.(8) A10	3.925
Butler,Pa. A10	3.925
Cleveland,O. R2	3.925
Conshohocken,Pa. A3	4.05
Detroit M1	4.15
Ecorse,Mich. G5	4.125
Fairfield,Ala. T2	3.925
Fairless,Pa. U5	4.025
Fontana,Calif. K1	4.70
Gary,Ind. U5	3.925
Geneva,Utah C11	4.025
GraniteCity,Ill. G1	4.125
Ind.Harbor,Ind. I-2, Y1	3.925
Irvin,Pa. U5	3.925
Kokomo,Ind. C16	4.025
Lackawanna,N.Y. B2	3.925
Chicago W18	6.325
Cleveland A7, C20	6.325
Detroit P7	6.425
Detroit P17	6.475
Detroit B5	6.525
Donora,Pa. A7	6.325
Elyria,O.-W8	6.325
Gary,Ind. R2	6.325
Hammond,Ind. I-2, M13	6.325
Hartford,Conn. R2	6.775
Harvey,Ill. B5	6.325
Lackawanna,N.Y. B2	6.325
Mansfield,Mass. B5	6.775
Massillon,O. R2, R8	6.325
Midland,Pa. C18	6.325
Monaca,Pa. S17	6.325
Newark,N.J. W18	6.65
Plymouth,Mich. P6	6.525
So.Chicago,Ill. R2, W14	6.325
SpringCity,Pa. K3	6.475
Struthers,O. Y1	6.325
Warren,O. C17	6.325
Waukegan,Ill. A7	6.325
Worcester,Mass. A7	6.625
Youngstown,O. Y1	6.325

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	4.15
Atlanta A11	4.40
Buffalo R2	4.15
Cleveland R2	4.15
Emeryville,Calif. J7	4.90
Fairfield,Ala. T2	4.15
Fairless,Pa. U5	4.30
Fontana,Calif. K1	4.85
Gary,Ind. U5	4.15
Houston,S5	4.65
Ind.Harbor,Ind. I-2, Y1	4.15
Johnstown,Pa. B2	4.15
KansasCity,Mo. S5	4.85
Lackawanna,N.Y. B2	4.15
LosAngeles B3	4.85
Milton,Pa. M18	4.15
Minnequa,Colo. C10	4.75
Niles,Calif. P1	4.85
Pittsburg,Calif. C11	4.85
Pittsburgh,Pa. P2	4.15
SandSprings,Okla. S6	5.05
Seattle B3, N14	4.90
So.Chicago,Ill. R2	4.15
So.Duquesne,Pa. U5	4.15
So.SanFrancisco B3	4.90
SparrowsPoint,Md. B2	4.15
Sterling,Ill. (1) N15	4.15
Struthers,O. Y1	4.15
Torrance,Calif. C11	4.85
Youngstown R2, U5	4.15

BARS, Reinforcing (Fabricated, to consumers)

Johnstown, ½-1" B2	5.55
KansasCity S5	6.35
LosAngeles B3	6.18
Marion,O. P11	5.55
Seattle N14	5.80
Seattle B3	6.25
So.SanFrancisco B3	6.25
SparrowsPt. ½-1" B2	5.55
Williamsport,Pa. S19	5.45

RAIL STEEL BARS

Ayis,Pa.(4) C18	4.75
ChicagoHts.(3) C2	4.50
ChicagoHts.(4) C2	4.75
ChicagoHts.(3,4) I-2	4.50
FortWorth,Tex.(26) T4	4.65
Franklin,Pa.(3) F5	4.50
Franklin,Pa.(4) F5	4.75
Marion,O.(3) P11	4.50
Moline,Ill.(3) R2	4.50
Tonawanda(3,4) B12	5.00
Williamsport,Pa.(3) S19	5.25
Williamsport,Pa.(4) S19	5.45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14	10.40
Economy,Pa.(D.R.) B14	12.90
Economy(Staybolt) B14	13.20
M.K.Rks.(Staybolt) L5	15.50
M.K.Rks.(S.R.) L5	10.40
M.K.Rks.(D.R.) L5	14.00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2	3.925
Allenport,Pa. P7	3.925
Ashland,Ky.(8) A10	3.925
Butler,Pa. A10	3.925
Cleveland,O. R2	3.925
Conshohocken,Pa. A3	4.05
Detroit M1	4.15
Ecorse,Mich. G5	4.125
Fairfield,Ala. T2	3.925
Fairless,Pa. U5	4.025
Fontana,Calif. K1	4.70
Gary,Ind. U5	3.925
Geneva,Utah C11	4.025
GraniteCity,Ill. G1	4.125
Ind.Harbor,Ind. I-2, Y1	3.925
Irvin,Pa. U5	3.925
Kokomo,Ind. C16	4.025
Lackawanna,N.Y. B2	3.925

Munhall,Pa. J5 ..... 3.925
Newport,Ky. N9 ..... 3.925
Niles,O. N12 ..... 3.425
Pittsburg,Calif. C11 ..... 4.625
Pittsburgh J5 ..... 3.925
Riverdale,Ill. A1 ..... 3.925
Sharon,Pa. S3 ..... 3.925
So.Chicago,Ill. W14 ..... 3.925
SparrowsPoint,Md. B2 ..... 3.925
Steubenville,O. W10 ..... 3.925
Torrance,Calif. C11 ..... 4.625
Warren,O. R2 ..... 3.925
Weirton,W.Va. W6 ..... 3.925
Youngstown,Us. Y1 ..... 3.925

SHEETS, H.R. (19 gage)

Alabama City, Ala. R2 ..... 5.225
Dover,O. R1 ..... 5.80
Mansfield,O. I6 ..... 5.05
Niles,O. N12 ..... 5.20
Torrance,Calif. C11 ..... 5.875

SHEETS, H.R. (14 ga. heavier) High Strength Low-Alloy

Cleveland,Ja. R2 ..... 5.90
Conshohocken,Pa. A3 ..... 5.90
Ecorse,Mich. G5 ..... 6.10
Fairfield,Ala. T2 ..... 5.90
Fontana,Calif. K1 ..... 7.00
Gary,Ind. Us 5.90
Ind Harbor,Ind. I-2 ..... 5.90
Ind Harbor,Ind. Y1 ..... 6.40
Irvin,Pa. U5 ..... 5.90†
Lackawanna,N.Y. B2 ..... 5.90
Munhall,Pa. Us 5.90
Pittsburgh J5 ..... 5.90
Sharon,Pa. S3 ..... 5.90
So.Chicago,Ill. U5 ..... 5.90
SparrowsPoint,Md. B2 ..... 5.90
Warren,O. R2 ..... 5.90
Weirton,W.Va. W6 ..... 6.15
Youngstown,Us 5.90
Youngstown,Y1 ..... 6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..... 4.175
Cleveland R2 ..... 4.525
Ind Harbor,Ind. I-2 ..... 4.175
Warren,O. R2 ..... 4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 ..... 4.775
Butler,Pa. A10 ..... 4.775
Cleveland,Ja. R2 ..... 4.775
Ecorse,Mich. G5 ..... 4.975
Fairfield,Ala. T2 ..... 4.775
Fairless,Pa. U5 ..... 4.875
Follansbee,W.Va. F4 ..... 5.775
Fontana,Calif. K1 ..... 5.875
Gary,Ind. U5 ..... 4.775
Granite City,Ill. G4 ..... 4.975
Ind.Harbor,Ind. I-2,Y1 ..... 4.775
Irvin,Pa. U5 ..... 4.775
Lackawanna,N.Y. B2 ..... 4.775
Middletown,O. A10 ..... 4.775
Pittsburg,Calif. C11 ..... 5.725
Pittsburgh J5 ..... 4.775
SparrowsPoint,Md. B2 ..... 4.775
Steubenville,O. W10 ..... 4.775
Warren,O. R2 ..... 4.775
Weirton,W.Va. W6 ..... 4.775
Youngstown Y1 ..... 4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland,Ja. R2 ..... 7.225
Ecorse,Mich. G5 ..... 7.425
Fontana,Calif. K1 ..... 8.275
Gary,Ind. U5 ..... 7.225
Indiana Harbor,Ind. Y1 ..... 7.725
Irvin,Pa. U5 ..... 7.225
Lackawanna(37) B2 ..... 7.225
Pittsburgh J5 ..... 7.225
SparrowsPoint,(38) B2 ..... 7.225
Warren,O. R2 ..... 7.225
Weirton,W.Va. W6 ..... 7.475
Youngstown Y1 ..... 7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 ..... 5.275
Cleveland R2 ..... 5.375
Middletown,O. A10 ..... 5.275
Warren,O. R2 ..... 5.375

SHEETS, Gal'd No. 10 Steel

Alabama City,Ala. R2 ..... 5.275
Ashland,Ky.(8) A10 ..... 5.275
Canton,O. R2 ..... 5.275
Dover,O. R1 ..... 5.525
Fairfield,Ala. T2 ..... 5.275†
Gary,Ind. U5 ..... 5.275†
Granite City,Ill. G4 ..... 5.475
Ind Harbor,Ind. I-2 ..... 5.325
Irvin,Pa. U5 ..... 5.275†
Kokomo,Ind.(13) C16 ..... 5.375
MartinsFerry,O. W10 ..... 5.275
Niles,O. N12 ..... 5.80
Pittsburg,Calif. C11 ..... 6.025†
SparrowsPoint,Md. B2 ..... 5.275
Steubenville,O. W10 ..... 5.275
Torrance,Calif. C11 ..... 6.275†
Weirton,W.Va. W6 ..... 5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 ..... 7.925
SparrowsPoint(39) B2 ..... 8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..... 5.325
Canton,O. R2 ..... 6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary,Ind. Us	6.075	6.325
Ind Harbor,I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.325	....
MartinsFry.,O.W10	6.075	....
Pitts.Cal. C11	6.525	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	6.525	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield, Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 5.825
Irvin,Pa. U5 ..... 5.825†
Kokomo,Ind.(13) C16 ..... 5.925
Niles,O. N12 ..... 6.35

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 ..... 5.525
Middletown,O. A10 ..... 5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 ..... 5.775
Middletown,O. A10 ..... 5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ..... 5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 ..... 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..... 5.175
Cleveland R2 ..... 5.175
Gary,Ind. U5 ..... 5.175
Granite City,Ill. G4 ..... 5.875
Ind Harbor,Ind. I-2 ..... 5.175
Irvin,Pa. U5 ..... 5.175
Middletown,O. A10 ..... 5.175
Niles,O. N12 ..... 6.775
Youngstown,Y1 ..... 5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 ..... 7.20
Follansbee,W.Va. F4 ..... 7.30
Follansbee (23) F4 ..... 7.175

SHEETS, Long Terne Steel (Commercial Quality)

Beech Bott'm,W.Va. W10 ..... 5.675
Gary,Ind. U5 ..... 5.675
Mansfield,O. I6 ..... 5.675
Middletown,O. A10 ..... 5.675
Niles,O. N12 ..... 6.00
Weirton,W.Va. W6 ..... 5.975

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ..... 6.075

SHEETS, Well Casing

Fontana,Calif. K1 ..... 6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ..... 3.925
Allenport,Pa. P7 ..... 3.925
Alton,Ill. L1 ..... 4.10
Ashland,Ky.(8) A10 ..... 3.925
Atlanta A11 ..... 4.175
Bessemer,Ala. T2 ..... 3.925
Bridgeport,Conn.(10)S15 ..... 4.15
Buffalo (27) R2 ..... 3.925
Butler,Pa. (8) A10 ..... 3.925
Carnegie,Pa. S18 ..... 4.425
Conshohocken,Pa. A3 ..... 4.05
Detroit M1 ..... 4.15
Ecorse,Mich. G5 ..... 4.125
Fairfield,Ala. T2 ..... 3.925
Fontana,Calif. K1 ..... 4.70
Gary,Ind. U5 ..... 3.925
Houston,Tex. S5 ..... 4.425
Ind Harbor,Ind. I-2,Y1 ..... 3.925
Johnstown,Pa.(25) B2 ..... 3.925
Kansas City,Mo.(9) S5 ..... 4.625
Lackawna,N.Y.(32) B2 ..... 3.925
Los Angeles(25) B3 ..... 4.675
Milton,Pa. M18 ..... 3.925
Minnequa,Colo. C10 ..... 5.025
New Britain(10) S15 ..... 4.15
N.Tonawanda,N.Y. B11 ..... 3.925
Pittsburg,Calif. C11 ..... 4.675
Riverdale,Ill. A1 ..... 3.925
SanFrancisco S7 ..... 5.10
Seattle(25) B3 ..... 4.925
Seattle N14 ..... 4.925
Sharon,Pa. S2 ..... 3.925
So.Chicago,Ill. W14 ..... 3.925
So.SanFrancisco(25) B3 ..... 4.675
SparrowsPoint,Md. B2 ..... 3.925
Torrance,Calif. C11 ..... 4.675
Warren,O. R2 ..... 3.925
Weirton,W.Va. W6 ..... 4.025
Youngstown,Y1, Us 3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 ..... 6.45
Carnegie,Pa. S18 ..... 6.40
Fontana,Calif. K1 ..... 7.80
Gary,Ind. Us 6.40
Houston,Tex. S5 ..... 6.90
Kansas City,Mo. S5 ..... 7.10
Los Angeles B3 ..... 7.60
New Britain,Conn.(10)S15 ..... 6.45
Sharon,Pa. S4 ..... 6.40
So.Chicago,Ill. W14 ..... 6.40
Youngstown Us 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 ..... 5.65
Conshohocken,Pa. A3 ..... 5.90
Ecorse,Mich. G5 ..... 6.10
Fairfield,Ala. T2 ..... 5.65
Fontana,Calif. K1 ..... 7.65
Gary,Ind. Us 5.95
Ind Harbor,Ind. I-2 ..... 5.95
Ind Harbor,Ind. Y1 ..... 6.45
Lackawanna,N.Y. B2 ..... 6.00
Los Angeles(25) B3 ..... 6.40
Seattle(25) B3 ..... 6.65
Sharon,Pa. S3 ..... 5.95
So.SanFrancisco(25)B3 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.00
Warren,O. R2 ..... 5.95
Weirton,W.Va. W6 ..... 6.30
Youngstown Y1 ..... 6.45
Youngstown Us 5.95

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 ..... 5.80
Bridgeport,Conn.(10)S15 ..... 5.75
Butler,Pa. A10 ..... 5.40
Cleveland A7, J5 ..... 5.45
Dearborn,Mich. D3 ..... 5.70
Detroit D2, P20 ..... 5.70
Detroit M1 ..... 5.65
Dover,O. G6 ..... 5.80
Ecorse,Mich. G5 ..... 5.80
Follansbee,W.Va. F4 ..... 5.45
Fontana,Calif. K1 ..... 7.35
Franklin Park,Ill.(40) T6 ..... 5.70
Ind Harbor,Ind. I-2 ..... 5.70
Lackawanna,N.Y. B2 ..... 5.45
Los Angeles C1 ..... 7.00
Mattapan,Mass. T6 ..... 6.30
Middletown,O. A10 ..... 5.45
New Bedford,Mass. R10 ..... 6.40
New Britain,(10) S15 ..... 5.75
New Castle,Pa. B4 ..... 5.45
New Castle,Pa. I5 ..... 5.85
New Haven,Conn. A7 ..... 5.65
New Haven,Conn. D2 ..... 6.20
Pawtucket,R.I. B3 ..... 6.80
Pawtucket,R.I.(21) N8 ..... 6.65
Riverdale,Ill.(40) A1 ..... 5.70
Rome,N.Y.(29) R6 ..... 5.45
Sharon,Pa. S3 ..... 5.45
SparrowsPoint,Md. B2 ..... 5.45
Trenton,N.J. R6 ..... 7.00
Wallingford,Conn. W2 ..... 6.20
Warren,O.(40) T6 ..... 5.95
Warren,O. R2 ..... 5.45
Warren,O. R2 ..... 5.45
Weirton,W.Va. W6 ..... 5.45
Worcester,Mass. W19 ..... 7.05
Youngstown C8 ..... 5.95
Youngstown Y1 ..... 5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10)S15 ..... 12.15
Carnegie,Pa. S18 ..... 12.00
Cleveland A7 ..... 12.00
Dover,O. G6 ..... 12.00
Fontana,Calif. K1 ..... 13.65
Harrison,N.J. C18 ..... 12.00
New Britain,Conn.(10)S15 ..... 12.15
Pawtucket,R.I.(11) N8 ..... 12.15
Pawtucket,R.I.(12) N8 ..... 12.45
Sharon,Pa. S3 ..... 12.00
Worcester,Mass. A7 ..... 12.30
Youngstown C8 ..... 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 ..... 7.80
Cleveland A7 ..... 8.15
Dearborn,Mich. D3 ..... 7.90
Dover,O. G6 ..... 8.00
Ecorse,Mich. G5 ..... 8.35
Lackawanna,N.Y. B2 ..... 8.15
Sharon,Pa. S3 ..... 7.65
SparrowsPoint,Md. B2 ..... 8.15
Warren,O. R2 ..... 7.60
Weirton,W.Va. W6 ..... 8.30
Youngstown Y1 ..... 8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ..... 6.05

STRIP, Electrogalvanized

Dover,O. G6 ..... 5.70
Warren,O. T6 ..... 5.70
Weirton,W.Va. W6 ..... 5.45
Youngstown C8 ..... 5.95

TIGHT-COOPERAGE HOOP

Atlanta A11 ..... 4.65
Riverdale,Ill. A1 ..... 4.50
Sharon,Pa. S3 ..... 4.35
Youngstown Us 4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur D. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Markt Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Electric Steel

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U1 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Workoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn. (10) S15	5.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	...
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.70	7.85	8.80	...	...
Detroit D2	6.45	7.85	8.45	10.55	...
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	...
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	...	...
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	...
NewYork W3	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N8:					
Cleve.orPitts Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	6.20	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.50	15.00	...
FranklinPark,Ill. T6	...	...	12.50	15.00	18.00
Harrison,N.J. C18	...	...	12.50	15.00	18.00
NewYork W3	...	...	12.50	15.00	18.00
Trenton,N.J. R5	...	...	12.50	15.00	18.00
Worcester,Mass. T6	...	...	12.50	15.00	18.00
Youngstown C8	...	...	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (cut lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Manafield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	...	...	...
Newport,Ky. N9 (cut lengths)	10.95	...	...	...
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	...	...	...
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.70
Irvin,Pa. U5	7.70
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb

Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.775
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Millbury,Mass. (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE (A)

Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead

Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. P5	12.85

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	8.00
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)

	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.925 7.475
Bartonville(19)K4	6.675 7.225
Buffalo W12	6.675 7.075
Cleveland A7	6.675 ....
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
JohnstownB2(48)	6.675 7.225
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo. S5	7.275 7.675
Kokomo,Ind. C16	6.775 7.175
LosAngeles B3	7.625 ....
Minnequa,Colo. C10	6.925 7.325**
Monessen P7(48)	6.675 7.225
Palmer,Mass. W12	6.975 7.375
Pitts.,Calif. C11	7.625 8.025†
Prtsmth (18) P12	6.675 ....
Rankin,Pa. A7	6.675 7.075†
So.Chi'go,Ill. R2	6.675 7.075**
So.S.Frn.(48)C10	7.625 8.025**
Spar'wsPt.,Md. B2(48)	6.775 7.325
Sterl'g(1)(48) N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester A7, ...	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone	Galv. Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	10.63	12.72*
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35
Kokomo C16	12.60	14.15
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.06
Pitts.,Calif. C11	12.85	14.40†
So.Chicago R2	12.50	14.05**
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	159
Bartonville,Ill. (19) K4	156
Crawfordsville,Ind. M8	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	173**
SparrowsPoint,Md. B2	158
Sterling,Ill.(1) N15	156

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga. Col.

Ala.City,Ala. R2	140**
Ala.City 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliqp'pa,Pa.9-14½ga. J5	143*
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga.,6" B2	234
Johnstown, 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	142

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)

Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	136
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 ($)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. ($)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S4 (†)	26.5	−0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W. Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 ($)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*) 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98.5% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe, minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	78.00
Brass, 20-ton lots	29.50-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	43.25
Reduced	43.25
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	52.00
Minus 100 mesh	57.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 90 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

*Plus cost of metal.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1⅝	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2⅝	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

	Std. All No. 1	Std. All No. 2	Std. Tee Rails All No. 2	60 lb Under
RAILS				
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	....
Huntington,W.Va. W7	....	....	....	5.20
Indiana Harbor,Ind. I-2	4.325	4.225	4.275	....
Johnstown,Pa. B2	....	....	...(16)5.20	
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.20
Steelton,Pa. B2	4.325	4.225	....	....
Williamsport,Pa. S12	....	....	....	5.20

TIE PLATES

Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated

Kansas City,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS

Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES

Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	7.05
Kansas City,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in.,larger 8.90c
⅞-in. under .....26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in & ⅝-in	5
¾-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1⅛", inclusive	60
1¼" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¾" and smaller	40
⅞" to 1½", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex.:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged, per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.5c; 1 15/16" to 7 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 7.80c.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 lb & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Rounderized.
(29) Youngstown base.
(30) Sheared; add 0.35c for universal mill.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 0.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6.7 gage.
(49) L post; add 2 cols. for T post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound, subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H R Strip	Shapes; H R & C F Bars, Wire	Plates	Sheets	C R Strip; Flat Wire
301	19.25	20.50	20.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	33.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	19.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L			36.75			42.75	43.25	54.25	49.00
305	19.50	24.50		36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	34.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	25.50	33.50	42.50	48.00	48.00	49.00	52.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314							69.00	74.50	
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L			52.50			61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	59.25	68.50	68.25	69.50	68.75	78.00	80.25
321	22.75	29.50	34.25	40.75	42.00	42.00	46.00	55.50	54.50
330			58.00			68.50	70.00	73.75	77.75
347	24.50	32.25	39.00	45.75	46.50	46.75	51.25	60.75	59.25
403			27.00	30.75		32.00	34.25	41.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416			24.50	28.25		29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	34.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F		18.75	24.00	28.25		29.75	31.00	44.00	44.00
431	14.50	28.50	24.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C		28.50	29.25	34.00		34.00	38.50	49.25	52.75
442			28.00			36.00	34.25	48.25	47.75
446			33.75	38.25	33.00	38.50	40.75	50.75	71.00
501			14.00	14.50	21.25	16.00	18.25	30.50	29.00
502			14.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Shenango Ageloy Tube Co.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302		31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	43.00		144.00
316	32.60	37.70-42.75	42.75	
318	37.00	42.20		
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60		
410	22.50	30.10		
430	22.90	30.10		
Inconel	41.23	54.18		165.00
Nickel	37.50	50.50		
Monel	38.00	51.80		
Copper*			46.00	

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.50	33.50	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. I-7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville I-7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25		4.055
18.25	4.25	1	4.75		2.340
18	4	2	9		2.565-2.695
18	4	2			1.820
18	4	1			1.580-1.660
13.5	4	3			1.875
6.4	4.5	1.9		5	1.065
6	4	3		6	1.300
2	1.4	1.2			0.495
1.5	4	1		8.5	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88		
Birmingham R2	52.38	52.88		
Birmingham U6		52.88		
Woodward,Ala. W15	52.38	52.88		
Cincinnati, deld		60.43		
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	
Tonawanda,N.Y. W12	56.00	56.50	57.00	
No.Tonawanda,N.Y. T5		56.50	57.00	
Boston, deld	66.63	67.13	67.63	
Rochester,N.Y., deld	59.02	59.52	60.02	
Syracuse,N.Y., deld	60.12	60.62	61.12	
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00		56.50	
IndianaHarbor,Ind. I-2	56.00		56.50	
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	
So.Chicago,Ill. U5	56.00		56.50	57.00
Milwaukee, deld	58.17	58.67	58.67	59.17
Muskegon,Mich., deld		62.80	62.80	
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	
Akron,O., deld. from Cleve.	58.74	59.24	59.24	59.74
Lorain,O. N3	56.00			57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld		62.28	62.78	
Newark, deld	61.92	61.92	62.02	62.52
Philadelphia, deld	60.74	61.24	61.74	62.24
Birdsboro,Pa. B10	58.00	58.50		
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld	57.37	57.87	57.87	
McKeesRocks, deld	57.04	57.54	57.54	
Lawrenceville,Homestead, Wilmerding,Monaca, deld	57.66	58.16	58.16	
Verona,Trafford, deld	58.19	58.69	58.69	
Brackenridge, deld	58.43	58.93	58.93	
Bessemer,Pa. U5	56.00		56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00			
McKeesport,Pa. N3	56.00			57.00
Midland,Pa. C18	56.00			
Monessen,Pa. P7	56.00			

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1			56.50	
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1			56.50	57.00
Youngstown U5	56.00			57.00
Mansfield,O., deld	60.90		61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	59.50	63.00	63.50	
Fontana,Calif. K1	62.00	62.50		
Geneva,Utah C11	56.00	56.50		
GraniteCity,Ill. G4	57.90	58.40	58.90	
Ironton,Utah C11	56.00	56.50		
LoneStar,Texas L6	52.00	52.50*	52.50	
Minnequa,Colo. C10	58.00	59.00	59.00	
Rockwood,Tenn. T3			56.50	
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld	61.76	62.26		

*Low phos. southern grade

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	95.50
Keokuk, OH & Fdry, 12½ lb pigiets, 16% Si, frt. allowed K2	98.50
Wenatchee,Wash. OH & Fdry, freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld	67.55
Troy,N.Y. R2	64.00

Aiming for Better Production?

J&L SCRAPLESS NUT WIRE CAN'T BE BEAT

Scrapless nut production is a tough business. It takes the best in know-how, the best in equipment and the best in wire.

You supply the production know-how and equipment and J&L will supply scrapless nut wire that's *right*.

When we say *right*, we mean-scrapless nut wire that has the—

SURFACE QUALITIES
WORKABILITY
UNIFORMITY
FINISH

. . . to increase die life, reduce down time and boost your over-all production of a better finished product.

J&L Steel wire is quality controlled from the mine through the finished product. J&L has the modern equipment to produce a really uniform high-quality product. J&L has the steel-making experience to provide a dependable source of supply.

The result—you'll find that J&L scrapless nut wire can't be beat. Why not investigate its economies now? Contact the J&L representative nearest you or write: Wire Products Department, Jones & Laughlin Steel Corporation, 401 Liberty Avenue, Pittsburgh 30, Pa.

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JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH

J&L STEEL

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal 10 Ga †	H R *	C R *	H R Rds	C F Rds ‡	H R Alloy 4140††		Carbon	Floor
Baltimore	6.20	7.04	7.75	7.00		6.96	8.17	12.04	6.98	6.86	7.98
Birmingham	6.10	7.00	8.00	6.90		6.74	8.00		6.85	6.75	8.05
Boston	6.55	7.53	8.18	7.15		6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.15	7.15	8.00	6.75		6.53	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.60	7.80		7.10	8.37		7.10	7.10	8.37
Chicago	6.15	7.12	8.00	6.92		6.75	7.90	11.75	6.46	6.75	7.46
Cincinnati	6.31	7.15	8.12	6.72		6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.15	7.12	7.90	6.55		6.34	7.64	11.89	6.76	6.50	7.79
Detroit	6.35	7.31	8.20	6.71	7.36	6.56	7.60	11.92	6.93	6.80	7.80
Erie, Pa.	6.15	7.15	8.01	6.54		6.28	7.70		6.56	6.50	7.79
Houston	7.15	7.80	8.40	7.45		7.45			7.35	7.20	8.55
Jersey City, N. J.	6.41	7.44	8.32	6.82		6.74	8.43	11.84	6.90	6.67	8.01
Los Angeles	7.25	8.00	9.35	7.55	11.20	7.45	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.25	7.20	8.17	6.99		6.45	7.67	11.92	6.63	6.50	7.63
Mobile, Ala.	6.95	7.47	8.50	6.77		6.65	7.65		6.81	6.65	
New York	6.44	7.45	8.42	6.82		6.74	8.43	11.84	6.90	6.67	8.01
Newark, N. J.	6.45	7.44	8.42	7.16		7.06	8.43		6.90	6.50	8.30
Norfolk, Va.	6.90			7.20		7.20	8.50		7.20	7.15	7.85
Philadelphia	6.33	7.04	8.41	7.02	8.80	6.87	8.20	11.89	6.97	6.63	7.66
Pittsburgh	6.18	7.12	8.20	6.85		6.28	7.64	11.89	6.46	6.33	7.46
Portland, Oreg.	7.15	8.70	9.40	7.90		7.60	10.65		7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10		7.04	7.95		7.10	6.86	8.10
St. Louis	6.45	7.42	8.50	6.72		6.58	7.79	12.05	6.86	6.74	7.86
St. Paul	6.54	7.78	8.65	7.05		6.94	8.06		7.12	6.99	8.12
San Francisco	7.55	8.70	10.15	7.60		7.15	9.75	13.05	7.25	7.20	9.25
Seattle	7.15	8.20	9.80	8.00		7.60	10.65	13.50	7.50	7.60	9.40
Spokane	7.15	8.10	9.80	7.95		7.60	10.55*	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.24	7.51		7.37	8.45		7.19	7.36	8.49

† Prices do not include gage extras; prices include gage and coating extras except Birmingham coating extra excluded; and Los Angeles (gages extra excluded). ‡ Includes 5 cent special bar quality extra; S as rolled, H as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip and cold finished bars, 2000 lb and over, except in Seattle where base is 2000 to 5999 lb, 3,500 to 9999 lb, 1000 to 1999 lb, 8 1000 lb and over. 1,000 lb to 3999, * under 1 ft

Distributors in East Raise Extras

Operators in Philadelphia revise those on alloy and carbon bars to cover higher costs. Pick-up in buying may indicate some users have reduced inventories too much

Philadelphia Warehouse operators are increasing extras on hot and cold-finished carbon bars; also on alloy bars. They are also increasing shearing extras on plates. Sellers point out there has been no change in these extras for some time and that higher costs make increases necessary.

Business so far this month is equal to, if not greater than, October volume on a day-to-day basis. In a few instances, orders for fairly sizable amounts have come in from mill buyers, indicating some consumers have let inventories get too low.

Pittsburgh With yearend inventory checks approaching, consumers are trimming purchases. Warehouse business is lagging, but there are few indications of price cutting. Standard shapes and wide flange beams remain tight, as are certain cold-rolled sheet sizes. Bars and tubular supplies are well rounded.

Chicago Warehouses attribute their substantially reduced volume of business to customer inventory clean-up. Balance of this year probably will reflect this influence. Largest inventories are in hot-rolled and cold-finished bars. In shortest supply are structurals, particularly wide flange sections. Biggest need is good inventory balance, including a better range of sizes and specifications.

Boston Warehouses have built up stocks and sizes on most products to meet small-lot order demand, now accounting for the bulk of volume. Actually, some distributors hold top-heavy inventories on one or two products with a resulting easing in prices. Some galvanized sheet tonnage is in this category, also buttweld pipe and welded tubing. Distributors are moving cautiously in writing up orders for the entire first quarter, some covering for January only. Warehouse distribution is upwards to 40 per cent for cold-finished bars in this area and stocks are more balanced as to grade and size in both carbon and alloys.

Cleveland Warehouse order volume is described as substantial, but with inventories much improved consumer pressure is off. Not much change in demand is expected over coming weeks. If anything, there will likely be further slackening as

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM A-305	$4.65	$4.75	$4.65	$4.90
Bar Size Angles	4.30	4.40	4.30	4.58
Structural Angles	4.30	4.40	4.30	4.58
I-Beams	4.30	4.40	4.30	4.58
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 3' X 10'	5.87	5.95	5.87	6.20
Furring Channels, CR, 1000 ft, 7/8 X 0.50 lb per ft	25.50	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.55	4.65	4.55	4.83
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.68	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.14	5.21	5.19	5.46
Channels	4.46	4.56	4.48	4.68
Bright Common Wire Nails, 8d	6.75	6.85	6.80	6.85

Size O.D.	Wgt Foot Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55				
5"	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7"	23	2.19/ft	2.17/ft	1.96/ft
Seamless N-80 Casing				
5"	17	1.94/ft	2.00/ft	1.75/ft
7"	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing				
2⅜"	4.7	0.60/ft	0.63/ft	0.55/ft
2½"	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

the holidays approach and yearend inventory-taking results in some manufacturing curtailments.

Cincinnati—Distributors are busy taking orders but their business is off as much as 25 per cent. Most items are in supply balance.

Seattle — Warehouse demand is spotty. Prospects are promising as much work is projected in the area. Inventories are improved. Wide flange structurals and plates continue tight.

Semifinished Steel . . .

Semifinished Prices, Page 132

Youngstown—Republic Steel Corp. has reduced its operating schedule on its bessemer converters slightly. Meanwhile, Youngstown Sheet & Tube Co., which shut down 6 open hearths a few weeks ago to reduce semifinished inventories, has started up two more open hearths, making 3 to be returned to production.

Tool Steel . . .

Tool Steel Prices, Page 136

New York—Shipments of high speed and tool steel (excluding hollow drill steel) totaled 8580 net tons in September, reports the American Iron & Steel Institute. This was a decline of 690 tons or 7 per cent compared with shipments in August, and was off 1278 tons or 13 per cent from the movement in September a year ago.

In the first 9 months of this year shipments amounted to 90,324 net tons, a drop of 2729 tons or 3 per cent from the tonnage movement reported for the like period of 1952.

Of the total September movement, 1540 tons were class A high speed steel, 299 tons class B, and 6911 tons other tool steels.

In the first 9 months class A shipments amounted to 16,645 tons, class B 2538 tons, and other tool steels 72,312 tons. This compares with 15,277 tons, 1872 tons and 75,904 tons, respectively, in the like period of 1952.

Comparative monthly shipment data for the past three years follow:

High Speed and Tool Steel Shipments*

(Net Tons)

	1953	1952	1951
January	9,769	14,483	13,158
February	10,016	13,533	12,580
March	10,782	13,226	13,539
April	11,525	11,133	14,064
May	10,863	10,287	15,670
June	11,505	5,100	14,776
July	8,569	5,615	12,208
August	9,270	9,818	15,351
September	8,580	9,858	13,879
October	....	10,429	14,700
November	....	8,960	13,645
December	....	9,778	14,072
Total	90,324**	122,220	176,044

* All grades, excluding hollow drill steel.
** 9 Mos.

Sheetmakers Booking For First Quarter

Demand pressure less insistent with consumers exerting more caution in covering forward requirements. Pickup in buying activity expected over coming weeks

Sheet and Strip Prices, Pages 132 & 133

Philadelphia—Sharp decline in electrical sheet demand from manufacturers of fractional horsepower motors emphasizes the lag in household appliances. This is reflected also in declining specifications for other grades. Producers of electrical sheets for fractional horsepower motors report business the lightest in months. On the other hand, demand for the higher silicon grades used in heavy electrical equipment is holding up fairly well, a good index of activity in the utilities field.

In most sheet consuming lines business is spotty. Stove specifications are off seasonally. Sanitaryware requirements lag and district television and radio manufacturers are specifying slowly. Air conditioning equipment manufacturers here are moving more cautiously on first quarter needs than expected.

Boston—Carbon sheet orders, first quarter, frequently disregard leadtime. Volume placed for January goes in late and more consumers are disposed to write up orders monthly rather than for the entire quarter.

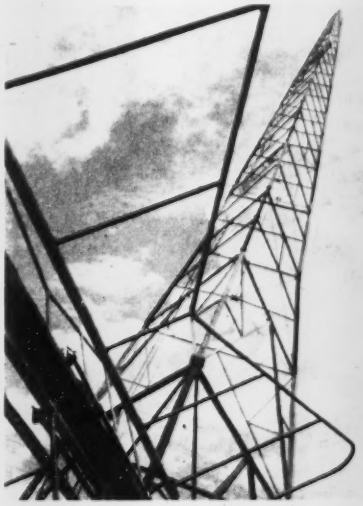
More mills are absorbing freight to equalize with the two nearest eastern producers or Buffalo.

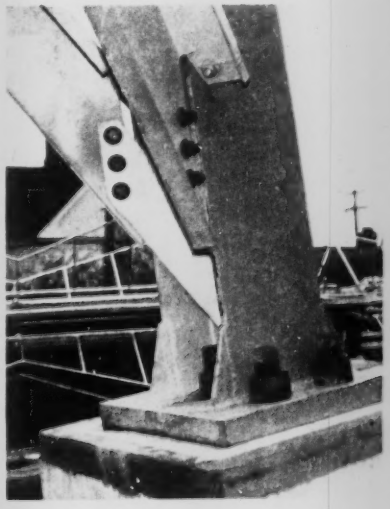
More nickel-chromium stainless is being booked for January, but volume is below expectations due to working off substantial straight chromium stocks.

New York—Demand for hot and cold-rolled sheets lags, with first quarter specifications coming out slowly. Some sellers believe the turn may come fairly fast and urge consumers not to drag their heels too long.

Most users have worked off excess inventories. Should activity perk up the complexion of things might change rapidly with existing inventories small.

Pittsburgh—Sheet production will remain at a favorable rate through December. Producers are filling order books for first quarter. U. S. Steel Corp. plans to augment finishing facilities at its Vandergrift, Pa.,



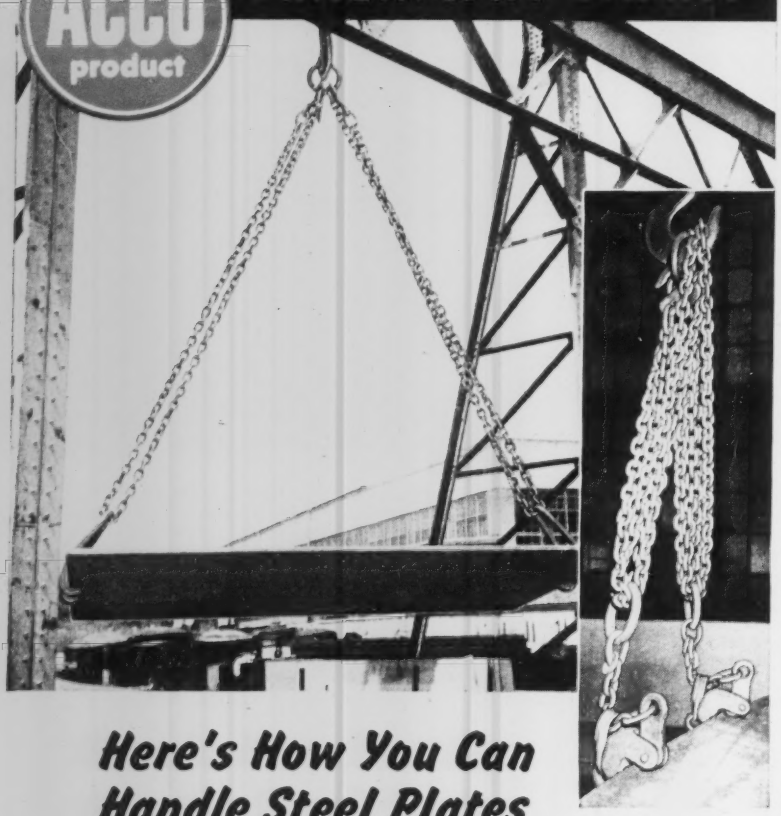


Use of High-Strength Bolts Soars

KOMO-TV's new 550-ft transmitting tower atop Queen Anne Hill, Seattle, is shown above, left. It is held together by 3500-lb of high-strength bolts, flown to Seattle from Bethlehem Steel Co.'s plant at Lebanon, Pa., in order to complete the job in time to begin telecasting on Dec. 11. This display of a critical need for a western source was the main factor in Bethlehem Pacific Coast Steel Corp.'s decision to produce this type bolt at its Los Angeles plant. Relatively new to steel erectors, these bolts are gaining wide acceptance. Seven of the bolts are shown in the picture at the right. Hardened washers under both head and nut permit development of a very high torque without scoring the connected structural steel members. The three large bolts visible in this photograph are anchor bolts

an ACCO product

AMERICAN CHAIN



Here's How You Can Handle Steel Plates

• These pictures show only two applications of an AMERICAN 125 Endweldur alloy ACCO *Registered* Sling Chain with ACCO series 80 Sling Hooks. The 2 legs are long enough for use with various length plates. They can also be used in a double-basket hitch for lifting two or more plates together.

The big advantage in using this AMERICAN Chain is in the small diameter, light weight, and great strength of the tough alloy chain, and in the short links which make the chain so flexible and easy to rig. See it in the right hand picture above.

Inside the plant this same sling chain is used in a wide variety of lifts on castings, housings, and finished machines. It has become sort of a "jack of all trades."

AMERICAN makes sling chains for every use with ACCO grab, sling, foundry, and special hooks. Note (*above*) the two ACCO *Registered* Sling Chains on the plate grabs. The ACCO Sling Chain Catalog gives you full information on America's finest chain slings—AMERICAN.

Write to our York, Pa., office today for Catalog DH-314

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American Chain

plant, to include production of grain-oriented silicon sheets and coils.

Cleveland Sheetmakers are booking substantial tonnage for first quarter but buyers are not pressing to get on mill books like they were only a few months back. Consumers are displaying caution in placing forward tonnage.

Cincinnati Warehouse supplies of sheets appear comfortable. The mill picture here offers the widest possible extremes. One large producer is breaking production records while a smaller mill has hit a new postwar operations low.

Chicago Except for farm equipment, first quarter demand for sheets looks solid. Some mills are fully committed on January output of cold-rolled although a few customers have not specified against quotas. Currently, consumers' demands are being well accommodated.

St. Louis Sheet orders disclose a trend to progressively short-term buying by consumers.

Los Angeles By an $8 million expansion program Kaiser Steel Corp., Fontana Works, will increase output of flat-rolled steel by 17 per cent and increase electrolytic tin plate production from 130,000 tons to 200,000 tons yearly. The combined capacity of the tandem plate and hot strip mills will be increased by approximately 10,000 tons per month.

Plates . . .

Plate Prices, Page 132

New York Plate business is far from brisk, but is moderately active. January mill schedules are filling up slowly. Pricewise, the situation is featured by a reduction in carbon plate by the Central Iron & Steel Co., Harrisburg, Pa., to 4.10c mill, effective Nov. 16. This is a drop of $17 per ton. Also, Jones & Laughlin Steel Corp. has reduced gage and width extras on light plate up to and including 3/16-inch to make them competitive with leading producers.

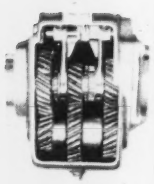
Boston Backlogs of most plate fabricating shops are lower, notably those of tank builders. The top premium price on carbon plates has been lowered by the Harrisburg, Pa., producer to 4.10c, mill, from 4.95c.

Philadelphia Except for certain premium-price producers, plate mills report good bookings through January.

Central Iron & Steel Co., Harrisburg, Pa., effective Nov. 16, reduced its price on carbon plate $17 per ton to 4.10c, mill.

Pittsburgh Gradual loosening of plate supply continues. Light plate is reported fairly tight. Demand is

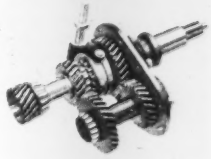
gears and gear assemblies



transmission gears and assemblies

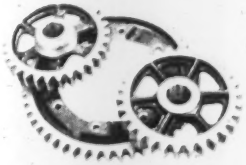
special gears and gear assemblies

spiral bevel gears



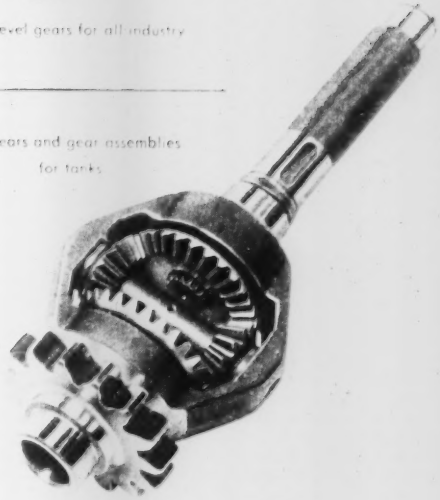
gears and gear assemblies for farm implements and tractors

bevel gears for all industry



gears for power shovels

gears and gear assemblies for tanks



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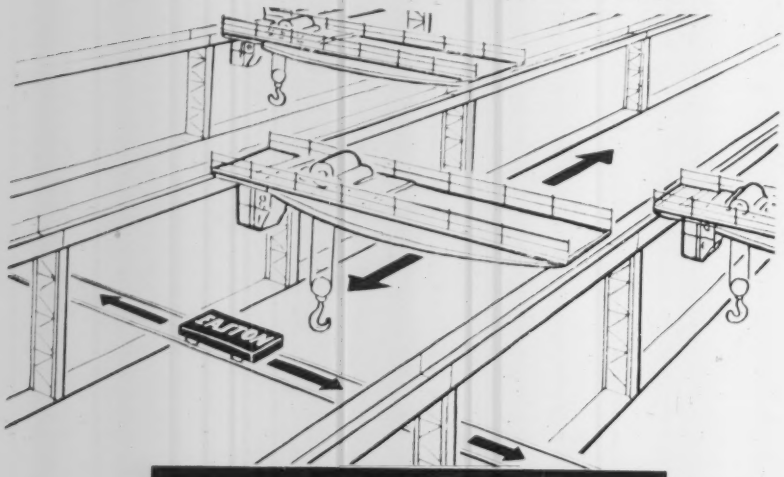

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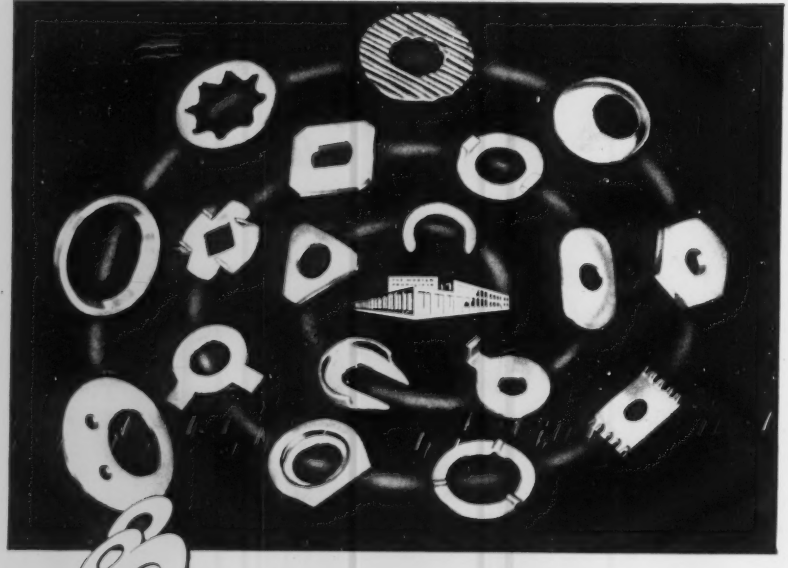

THE *Master Products* CO.

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slowly dropping to more normal levels.

Seattle — Fabricators await bid calls on 15,000 to 20,000 tons of plates for the Shell Oil Co.'s proposed refinery at Anacortes, Wash. Also up for early action are 42,000 tons of plates for the Alaskan oil pipeline.

Steel Bars . . .

Bar Prices, Page 132

Cleveland — Demand for bars for first quarter delivery is quickening after getting off to a slow start compared with recent past years. One large seller of cold finished reports that in the last two weeks there has been a noticeable pickup in consumer requirements for the period, in some instances requests being made to advance tonnage deliveries to January that only recently had been deferred by the buyers until February or later.

Boston — Number of spot orders for prompt delivery, December, indicates bar users, carbon and alloy, have broken down inventory balance too drastically. To maintain production they need more steel promptly. This applies notably to several making screw machine products.

First quarter orders are more numerous, but few users have written up forward commitments beyond January.

New York — Hot carbon bar supply is easy. Consumers show little interest in first quarter shipments. They are able to obtain shipments before end of this year on a wide range of sizes.

Philadelphia — While the downtrend in bars is leveling off, demand is spotty. Hot carbon bar producers are virtually out of the market for this quarter but first quarter business is developing slowly. Cold drawn carbon bars can be had from stock in a variety of sizes.

Pittsburgh — Most carbon bar consumers have completed inventory readjustments. Barmakers predict a good first quarter following a satisfactory fourth quarter. Demand for large size bars has dropped to a level with smaller sizes.

Chicago — There is no deficiency in bar supply now, either hot-rolled or cold-finished. Sharp drop in farm machinery requirements and easing in automobile production have taken care of that.

St. Louis — Pressure of demand on building bars is increasing, while leveling off or dropping slightly on merchant bars. Concrete bar pickup is due to a large highway construction program, plus steady de-

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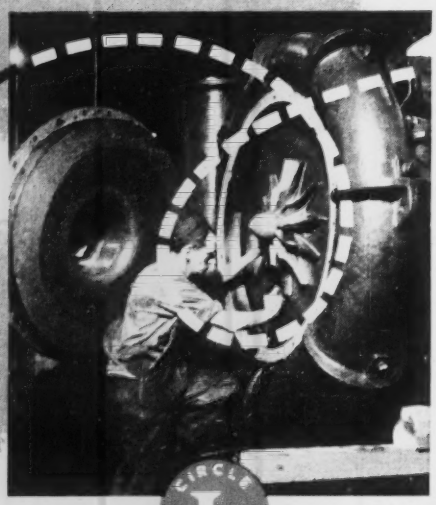
IN THE CENTER OF A
Miniature tornado



LEBANON STEEL Castings are at work

WHIPPING up a wind as high as 120 mph is the job of Elliott Company's Single-Stage Centrifugal Blowers. In these blowers the "tornado-builder" is a one-piece, open type, radial-bladed impeller—a Lebanon CIRCLE (L) casting engineered to withstand unusual service conditions.

These Elliott Blowers are widely used by the Chemical (particularly in sulphuric acid plants), Power, Refining and Gas industries where they run continuously, 24 hours a day. Such difficult service requires excellence of product design and manufacture, for a stopped blower can mean a plant shut-down. That Lebanon CIRCLE (L) castings are specified by Elliott is recognition, we believe, of the superior workmanship that is traditional with Lebanon Steel Foundry craftsmen.

See—STEEL WITH A THOUSAND QUALITIES—37-min., 16 mm. full-color, sound film on the making of steel castings. For information write: Dept. B, Lebanon Steel Foundry.

LEBANON Castings
CARBON, SPECIAL ALLOY AND STAINLESS STEEL
LEBANON STEEL FOUNDRY LEBANON, PA.

mand for school and commercial construction. First quarter books are filled through January and February.

Los Angeles—Bar demand is sluggish. Bethlehem Pacific Steel Corp. with more bar and bar-sized shape producing capacity than the current market can absorb, cut back production to 49 per cent of theoretical capacity.

Stainless Steel . . .

Stainless Steel Prices, Page 136

New York—Production of stainless and heat-resisting steel ingots, all types, totaled 242,000 net tons in third quarter this year, reports the American Iron & Steel Institute. This was a decline of 48,160 tons, or 16 per cent, from production in second quarter, but was an increase of 46,215 tons, or 23 per cent, compared with output in third quarter of 1952.

In the first 9 months this year output was 836,403 net tons. This was an increase of 227,862 tons, or 37 per cent, compared with production in the like 9 months of last year, a period in which production was severely curtailed by the steel strike in June and July.

Comparative quarterly production data for 1953 and the two preceding years follow:

Production of Stainless And Heat Resisting Steel Ingots
(All types; net tons)

	1953	1952	1951
First Quar.	303,843	250,601	218,126
Second Quar.	290,360	161,982	226,780
Third Quar.	242,200	196,955	235,529
9 Mos.	836,403	608,541	680,435

Wire . . .

Wire Prices, Page 134

Boston—Rope mills promise four weeks or better on plow steel grades. This applies to specification orders with stock shipments earlier. Prompt delivery on numerous products tends to retard forward buying. As in November, many finishing departments will not be scheduled near capacity in December. Freight equalization on wire from Pittsburgh and other points is prevalent.

Pittsburgh—Effects of the drought are reflected in low purchases of wire by farmers. Merchant wire sales are still dropping but sales of manufacturers wire are increasing. Consumers are replenishing inventories.

Cleveland—American Steel & Wire Division, U. S. Steel Corp., has awarded a contract for a new rod mill here that will run off steel rods to coiling reels at a speed of more than 60 miles per hour. The Morgan Construction Co., Worcester, Mass., has the contract for the mill, which,

THE AMERICAN STORY

CHAPTER 15

All our own cards ...and we stack them against ourselves!

This is a typical "hand of cards" dealt out daily in both of American's plants. They are some of the *routine* inspection forms used to control the quality and progress of every order according to original specifications and schedules . . . every step of the way from raw material to shipment.

And these forms, too, are *inspection tools*, just as much as gages and laboratory instruments. Even more, they are documents that bear witness to the *unceasing unseen efforts* of American to make sure that you get a higher perfection-percentage in every order you send to Willimantic or Norristown for American Phillips Screws. Yes, it's well to bear in mind that *American takes more trouble* . . . to see that no trouble is made for *you*. Write:

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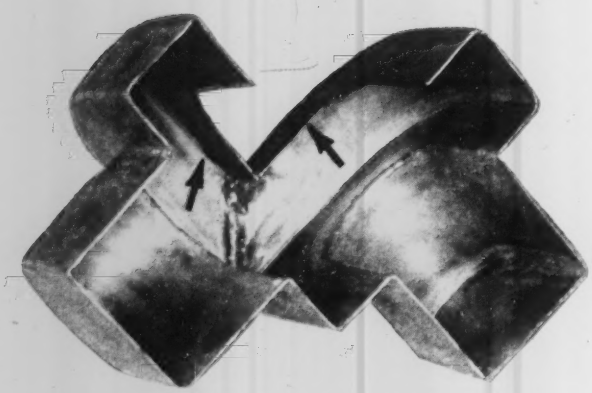


Gear cover fabricated from nine pieces. Arrows show cut-outs.

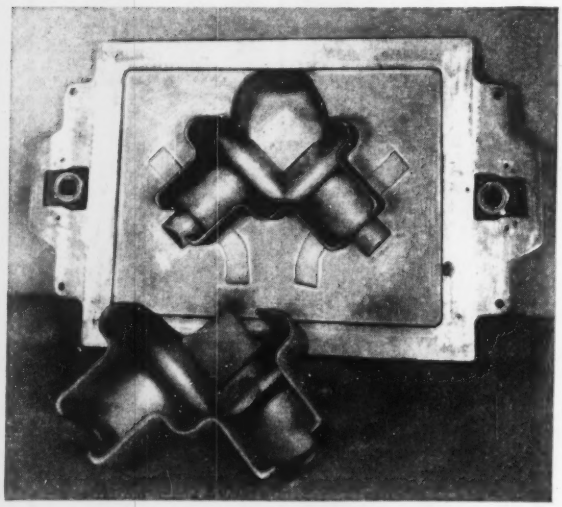
Made entirely in green sand, the Gray Iron castings were produced at one-tenth the cost of fabricated gear cover.

Formerly, nine separate pieces were shaped and welded into a fabricated gear cover for a braiding machine. Then, the manufacturer redesigned the gear cover for production in Gray Iron.

The finished and machined casting cost *less than 10%* of the production cost for the fabricated piece. This saving quickly paid for pattern-equipment costs . . . netting a *90% saving* on all parts thereafter. By redesigning for Gray Iron, the manufacturer not only made substantial savings, but obtained the advantages of a streamlined, vibration-absorbing gear cover.

Look at the structural and functional requirements of your fabricated parts. You can undoubtedly use the unique characteristics of Gray Iron—and the economy offered by this casting process. Why not write us for more information?

Matchplate and gear cover.



GRAY IRON CHARACTERISTICS INCLUDE:

Castability	Low Notch Sensitivity	Corrosion Resistance
Strength	Wear Resistance	Durability
Rigidity	Heat Resistance	Vibration Absorption
	Machinability	

MAKE IT *BETTER* WITH GRAY IRON

75% of all cast metal products are Gray Iron

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

it is estimated, will cost between $10 and $20 million. Construction will start in a few weeks. The mill, incorporating the latest electronic and automatic controls, will roll rods of from 7 32ds of an inch to 1½ inches.

Tubular Goods . . .

Tubular Goods Prices, Page 135

New York—Barium Steel Corp. awarded a contract to Innocenti, S.G., of Milan, Italy, for specialized equipment for a new seamless tube mill at its Phoenix Iron & Steel Co. plant at Phoenixville, Pa. Construction already has begun on the new mill, which will produce heavy-wall seamless tubing of gages, weights and lengths obtainable now only from foreign steel producers.

Boston—There are weak spots in tubular products. Buttweld pipe at the distributor level is off 10 per cent, and some producers of welded tubing are selling surplus at bargain prices on prompt delivery. January steel pipe bookings are not up to the tonnage offered.

Pittsburgh—Oil country goods lead all tubular products in sales volume. Consumers of other tubular goods have largely completed inventory reduction and are resuming buying. Specialty tubing sales efforts have been stepped up.

Seattle—The cast iron pipe market is in the seasonal doldrums. Current sales consist of small out-of-stock lots. Improved demand is expected next month.

Structural Shapes . . .

Structural Shape Prices, Page 132

Boston—Structural fabricating shops have three to four months backlogs, but competition is sharper to hold unfilled bookings at that level. Producers of plain material are not equalizing through freight, and with labor costs high, lower priced fabricated steel comes mostly at the expense of profit margins.

New York—Building continues fairly active. Bridge work dominates but other work is going ahead, including a 3200-ton municipal hospital in Newark, N. J. Most fabricating shops are in comfortable position, with the larger shops booked up several months ahead.

Philadelphia—Bids were closed on considerable Pennsylvania state bridge work last week. Otherwise, the structural market is featureless.

Pittsburgh—Wide flange beams and standard structural shapes continue in tight supply. Fabricators have difficulty securing shipments on schedule.

Seattle—Small jobs are fairly num-

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erous and plant operations continue steady. With the exception of wide flange beams, steel supply is reasonably easy.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 132

Seattle—Orders have declined but hopes continue that present operating levels will be held through the winter although backlogs are running out.

Pig Iron . . .

Pig Iron Prices, Page 136

Chicago—There is no indication foundry operations will improve significantly during balance of this year. Shipments of pig iron are off and several of the six idle blast furnaces in the district are out on this account.

Boston—Ample pig iron tonnage is in sight to meet the current melt. Delivered price equalization at several points is not adding much to total volume. Several machine builders are operating at a high rate, but others are below earlier peak.

New York—Little pick-up is noted in pig iron. Foundries are operating on a restricted basis.

Buffalo—Merchant pig iron demand continues spotty, and district blast furnace production rate has dropped 18 points to 76 per cent of capacity with 3 stacks down for relining.

Philadelphia—No pickup is noted in pig iron demand. The market is quiet, particularly in foundry grades. No early gain is anticipated by either domestic producers or importers.

Pittsburgh—Pittsburgh Steel Co. cast hot metal last week from its relined and improved No. 3 blast furnace at Monesen, Pa. Capacity has been increased by 64,000 net tons a year. The furnace went down July 15. After the stack resumed operations, Pittsburgh Steel closed its No. 2 blast furnace at Monessen for less extensive repairs.

Cleveland—Merchant pig iron sellers report sluggish demand with foundry operations spotty. No change for the better is anticipated in the weeks immediately ahead, though the view is expressed buying will spurt once the pattern of production for next year in automotive and other large consuming lines is more definitely determined.

Youngstown—Republic Steel Corp. has blown out its No. 4 blast furnace, a 650-ton unit.

Cincinnati—Foundry activity is expected to be slow until after turn of the year. Auto model changeovers

Here are two men saving money

BOTH of the men pictured here are saving money by packaging their products with U·S·S Gerrard Steel Strapping.

The man on the left is using Gerrard Round Steel Strapping, which, in the first place, costs about 40% less than any other metal reinforcement. Secondly, he is doing his job faster and more efficiently because Round Steel Strapping will turn any corner smoothly, will tie any shaped crate or bundle snugly and securely.

The man on the right is using heavy-duty, easy-to-seal Gerrard Flat Steel Strapping. Both the finished crates, round-strapped or flat-strapped, will be "locked shut," practically pilfer proof.

There's a big savings in reduced man hours, too, in tying with Gerrard Strapping. Neatly palletized bundles of machine parts, forgings or steel pipe are easier to handle, easier to stack.

And the headache is taken out of the inventory. You need never recount the units in a bundle once they've been tied, whereas loose pieces need constant retallying every time they are moved.

By making Gerrard your single source of supply for both Round and Flat Steel Strapping you'll save time and simplify paper work, using one purchase order for all your strapping. And you'll save on freight charges by combining shipments of Round and Flat Steel Strapping in a single carrier.

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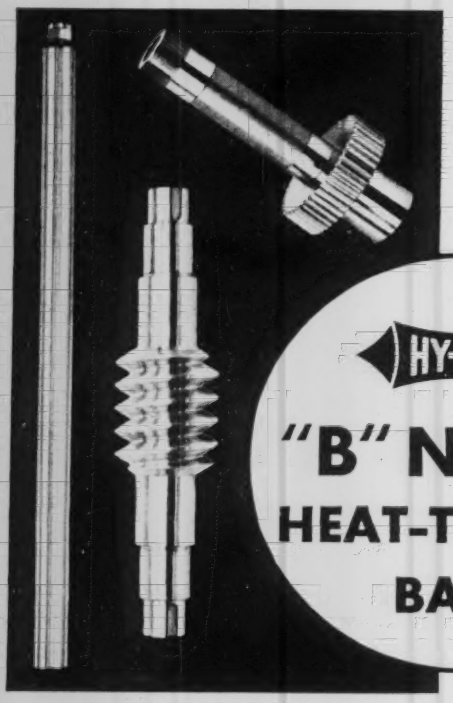

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and inventory slicing are reflected in slow pig iron sales currently.

Iron Ore . . .

Iron Ore Prices, Page 155

Cleveland — With a new season shipping record already established, the Great Lakes iron ore fleet continues to bring down well over 1 million tons of ore weekly, and indications are the total movement for the 1953 lake season will exceed 96 million tons.

Shipments in the week ended Nov. 16 were 1,479,285 gross tons, reports the Lake Superior Iron Ore Association. While this was substantially under the 2,654,186 tons shipped in the like week of 1952, it brought the 1953 total to date to 94,199,631 tons.

Republic Steel Corp. has laid up its three Great Lakes ore carriers for the winter. The vessels hauled 1,800,000 tons of ore during the 1953 season. Republic has an excellent stockpile for the winter of Mesabi range ore for operating the 17 of its 22 blast furnaces which use Mesabi ore.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 155

Chicago — Shipments of foundry coke show some pickup but they are considerably below normal. The better movement is attributed to rebuilding of inventories rather than improvement in melting operations.

Scrap . . .

Scrap Prices, Page 158

Washington — Specifications for the principal grades of open-hearth scrap are revised, effective Jan. 1, 1954, following consultation between committees of the American Iron & Steel Institute and the Institute of Scrap Iron & Steel Inc. Consumers will likely accept scrap on old orders prepared against the former specifications until Feb. 1.

The following are the revised classifications:

No. 1 Heavy Melting Steel: Clean wrought iron or carbon steel scrap ¼ inch and over in thickness, not over 18 inches in width and not over 5 feet in length. Individual pieces must be free from attachments, and so cut as to lie flat in the charging box. May include new mashed pipe ends, 4 inches and over.

No. 2 Heavy Melting Steel: Wrought iron or carbon steel scrap, black or galvanized, ⅛-inch and over in thickness, not over 18 inches in width and not over 3 feet in length. Individual pieces must be free from

(*Please turn to page* 155)

Make it the Biggest Bonus ever— Give it in U.S. Savings Bonds

If your company is one of the more than 45,000 companies that have the Payroll Savings Plan you *know* what your employees think of Savings Bonds—they spell it out for you every month in their Savings Bond allotments.

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—every month, *before they get their pay checks or envelopes*—8,000,000 men and women enrolled in the Payroll Savings Plan invest $160,000,000 in U. S. Savings Bonds.

—the ranks of Payroll Savers are growing: On June 30th sales of $25 and $50 Savings Bonds, the sizes purchased chiefly by Payroll Savers, were 6% and 9% higher than in the corresponding period of 1952.

—Payroll Savers hold their Bonds: 75% of the $7,100,000,000 Series E Bonds which had matured up to June 30, 1953, were being retained by their owners beyond maturity under the automatic extension program.

—on June 30, 1953, the *cash value* of Series E and H Bonds—the kind sold only to individuals—totaled $36,043,000,000, a new high.

It costs no more to give your Christmas Bonus in Savings Bonds. To the Payroll Saver, and to the man who buys his Bonds at a bank (because his company does not provide the Payroll Savings Plan) a One Hundred Dollar Savings Bond looks bigger and better than a check for $75. *Make this a merrier Christmas for every employee. Give the gift that keeps on giving.*

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STEEL

The Weekly Magazine of Metalworking

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.6c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low Carbon Ferrochrome: (Cr 67-72%) Contract, carload lump, bulk, max. 0.02% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.80c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l., 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.1c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c, less ton lot, 20.4c, delivered, spot, add 0.25c.

Low Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.06% max.) Contract, carload, lump, 4" x down and 2" x down, bulk 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon, 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant, freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr. 36-39%, Si 26-39%, Al 7.5%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D, packed, max 0.50% carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 5-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-43%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 50c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.10 per lb of contained W; 2000 lb W to 10,000 lb W, $4.20; less than 2000 lb W, $4.32, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%) Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c, less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

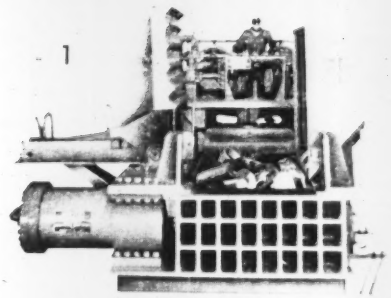
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

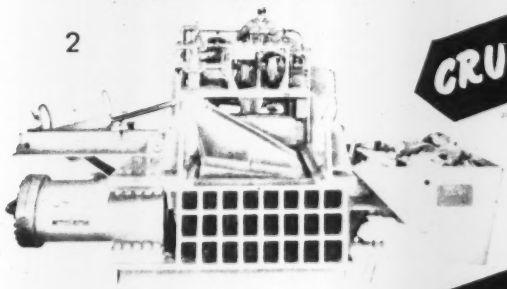
Ferrophosphorus: (23-25% based on 24% P content with initiage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

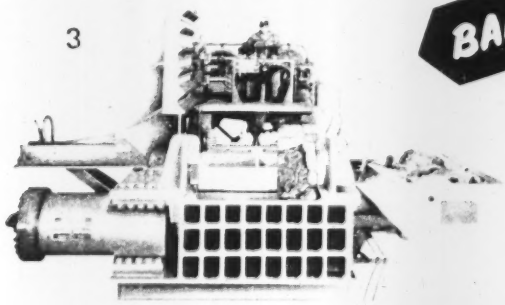
Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.



LOAD IT



CRUSH IT



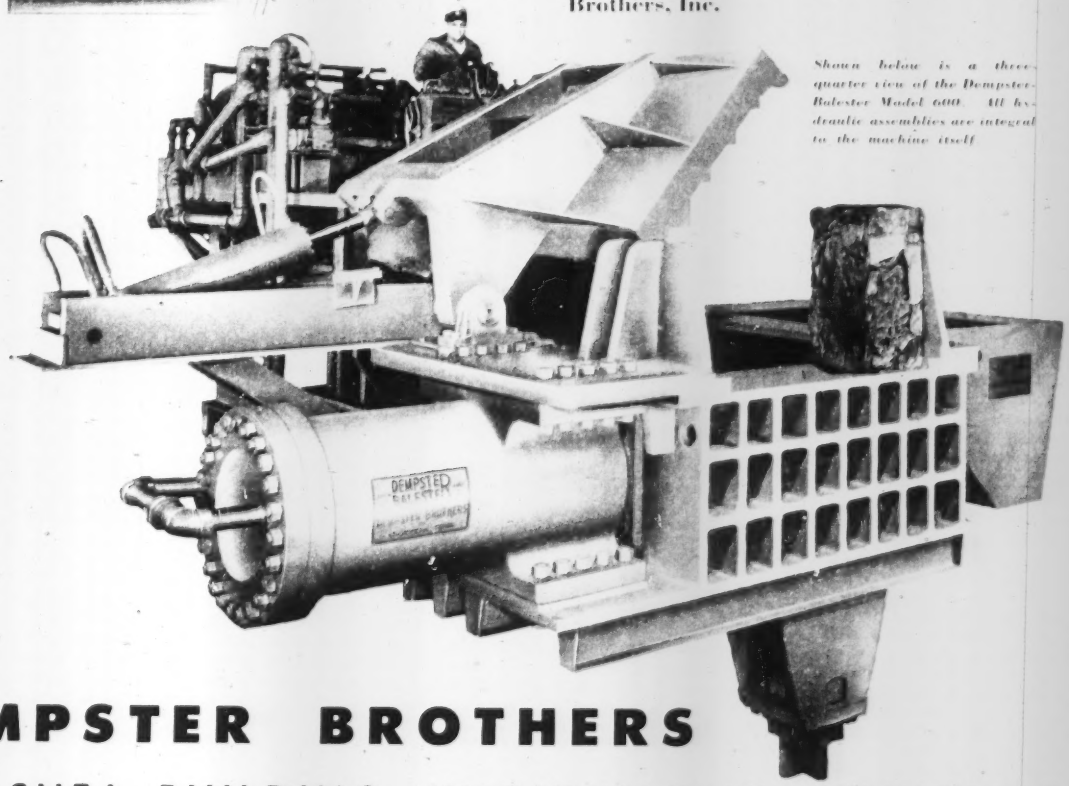
BALE IT

DEMPSTER-BALESTER GIVES YOU ALL 3 HYDRAULIC ACTIONS FOR FAST, CONSISTENT, MORE PROFITABLE SCRAP METAL BALING!

The Dempster-Balester's "*Load It—Crush It—Bale It*" hydraulic action assures you of the fastest scrap metal baling operation . . . the closest approach yet to automatic baling!

It's a simple 1-2-3 continuous operation . . . Skip Pan Loader loads charging box. As Skip Pan returns to re-loading position, Auxiliary Compression Door compresses scrap with a 45-ton force. As Compression Door returns to up-right position, charging box closes . . . scrap is baled and ejected. Skip Pan has been re-filled and is ready to re-load charging box as soon as bale is ejected. As each cycle ends, another begins . . . *Load It—Crush It—Bale It—Load It—Crush It—Bale It* . . . one bale after another.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from . . . three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. Write to us today for complete information. A product of Dempster Brothers, Inc.



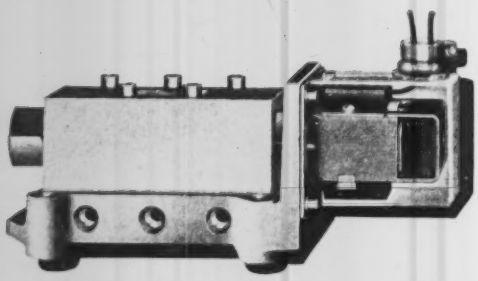
Shown below is a three-quarter view of the Dempster-Balester Model 600. All hydraulic assemblies are integral to the machine itself

DEMPSTER BROTHERS

8113 SHEA BUILDING, KNOXVILLE 17, TENNESSEE

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

FEATURE THIS MONTH

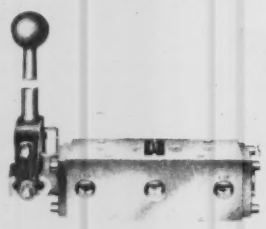


1/8" and 1/4" Single Solenoid Valves

They'll give you up to 300 cycles a minute
For air to 125 psi—vacuum—
or low pressure hydraulic service

● These valves combine the utmost simplicity in design with rugged construction. They will give you millions of cycles of highly satisfactory, efficient, trouble-free service. Small solenoid, with short stroke operates the valve plunger, eliminating levers, links and pins. Low amperage requirement eliminates intermediate relays and simplifies electrical control circuits. Side or bottom pipe connections. Valve body and solenoid are both mounted on an aluminum base and can be removed independently without disturbing the piping. 2, 3, 4 and 5-way actions. *Write for full details today!*

also the following

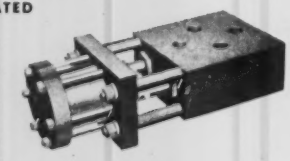


LEVER OPERATED SINGLE PLUNGER VALVES

Two position and three position valves, 3/8" to 1 1/2" sizes; 2-way, 3-way and 4-way actions. Widely used for controlling the operation of single and double acting cylinders or as pilots for operating other valves.

PILOT CYLINDER OPERATED HYDRAULIC VALVES

Two position valves, 1/2" to 4" sizes, for line pressures from 1000 to 5000 psi. Valve is placed close to the work and operated from a central control point with an easy to handle air valve avoiding operator fatigue.



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C. B. HUNT & SON, Inc.

Hand, Foot, Lever, Cam, Pilot, Diaphragm and Solenoid Control Valves

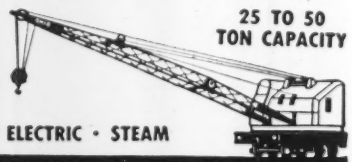
1911 EAST PERSHING STREET • SALEM, OHIO

SCREWED UP OVER REJECTS?
see
SEABOARD
for fast delivery of clean, top quality tapping and machine screws...MADE RIGHT!

Send for prices now 8621

Seaboard
SCREW CORPORATION
Plant at W. Warwick, Rhode Island
BRASS, STEEL, AND STAINLESS

OHIO LOCOMOTIVE CRANES

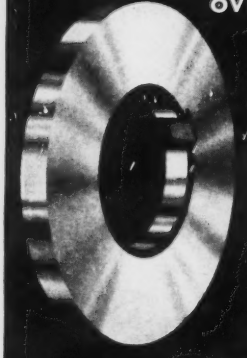


25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

COWLES
GANG SLITTING KNIVES
OVER 30 YEARS EXPERIENCE



Standard for Service and Durability. Ground to extremely close Tolerances and Finish. Made by *Toolmakers.*

COWLES TOOL COMPANY
2086 W. 110th ST. CLEVELAND 2, OHIO

Scrap . . .

(Concluded from page 150)

attachments and so cut as to lie flat in the charging box. May include pipe cut 3 feet and under. May not include automobile body and fender stock.

No. 2 Bundles: Body and fender carbon steel scrap, or old black and or galvanized carbon steel scrap, hydraulically compressed to charging box size and weighing not less than 75 pounds per cubic foot. May not include turnings, beadwire, vitreous enameled stock, tin cans, tin plate, terne plate or other metal coated material. May include hydraulically compressed black or galvanized fence wire and light coil springs.

No. 3 Bundles: Off-grade material, compressed to charging box size and weighing not less than 75 pounds per cubic foot. May include tin cans, tinned, galvanized, vitreous enameled and other coated ferrous scrap not suitable for inclusion in No. 2 bundles. Must be free of dirt, nonferrous metals and non-metallics of any kind.

Incinerator Bundles: — Tin can scrap, compressed to charging box size and weighing not less than 75 pounds per cubic foot. Must have been processed through a recognized garbage incinerator. Must be free of dirt, nonferrous metals and non-metallics of any kind.

Boston Steel scrap prices are edging upward on moderate new buying in this area. Activity is mostly in No. 2 heavy melting and bundles, although borings and turnings are stronger.

New York Consuming pressure for scrap remains light, and while brokers' buying prices here are unchanged, the market undertone is easier. Continuation of strikes at dealers' yards has materially slowed the movement of tonnage.

Buffalo Dip in the ingot rate and irregular trends in the market elsewhere are reflected in an easier scrap market here. Prices, however, are unchanged as dealers continue to ship against large orders still outstanding at prices within prevailing ranges.

Philadelphia Prices are unchanged but the tone of the scrap market is easier. This is particularly true with regard to low phos structurals and plates, and No. 1 bundles. Contributing to easing sentiment are faltering district steel mill operations.

Cleveland While some releases on old contracts are coming through from the mills, there is virtually no new buying of steelmaking grades reported in this district. As a result the market is more-or-less marking time pending resumption of ac-

MARKET PRICES

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65%, WO_3, good commercial quality	$39-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

		Indian and African	
48%	2.8:1		$40.00-$42.00
48%	3:1		44.00-46.00
48%	no ratio		32.00-34.00
		South African Transvaal	
44%	no ratio		$27.00-$28.00
48%	no ratio		34.00-35.00
		Brazilian	
44%	2.5:1	lump	nom. $32
		Domestic (Rail nearest seller)	
48%	3:1		$39.00

Molybdenum

Sulphide concentrate, per lb. Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vanadalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2000° F.: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, producing point

Phenol, 90 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective Calf$_2$ content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

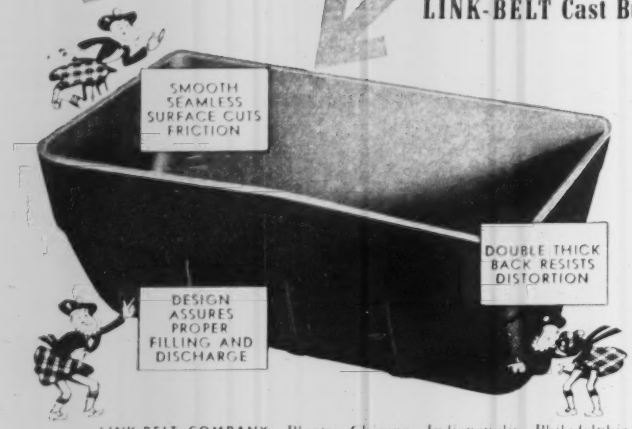
Inches Diam	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

Here are buckets tailored for rough, tough elevator service

LINK-BELT Cast Buckets pay dividends in longer life, cleaner handling


SMOOTH SEAMLESS SURFACE CUTS FRICTION
DOUBLE THICK BACK RESISTS DISTORTION
DESIGN ASSURES PROPER FILLING AND DISCHARGE

Yes, Link-Belt Cast Buckets are durable. Made of the highest grade malleable iron or Promal (the stronger, longer wearing metal)—they resist abrasion and corrosion . . . stand up better under day-in, day-out usage. Improved casting methods assure uniformity. And special construction features help build their reputation for improved performance.

Find out how Link-Belt Cast Buckets can save you money. There are many styles and sizes available for a wide range of applications . . . for either chain or belt mounting. Steel buckets of various designs are also furnished. Call your Link-Belt sales representative or distributor for local stocks and information.

LINK-BELT

CAST ELEVATOR BUCKETS

13.216

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

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STAMPINGS

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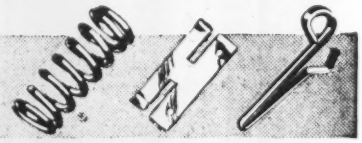

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The *Cleveland Steel Tool Co.*

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IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE

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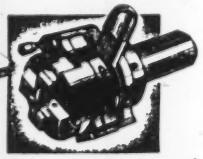
WE FEATURE SPECIAL PUNCHES & DIES

660 E. 82nd ST., CLEVELAND, O.

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.

Pacific Coast Representative: *A. C. Borbringer, 334 N. San Pedro St., Los Angeles, California.* Canada: *F. P. Barber Machinery Co., Toronto, Canada.*

WARDS HOLD WORLD SELLING RIGHTS FOR LATHES, PRESS BRAKES GUILLOTINE SHEARS and ALLIGATOR SHEARS

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(MACHINERY DIVISION)

ALBION WORKS—SHEFFIELD, ENGLAND.

75 years service in the supply of plant and equipment for engineering and allied industries

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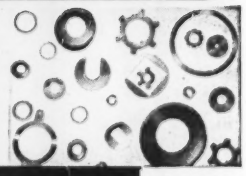
"WHITEHEAD WILL HAVE DIES FOR THESE WASHERS"

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. WRITE FOR CATALOG



WHITEHEAD STAMPING CO.

1667 W. Lafayette • Detroit 16, Mich.

tive buying. Prices, both on steel and cast grades, are unchanged for the present.

Pittsburgh Open hearth grades of scrap slumped $1 a ton as sales declined last week. Lower prices result from weakened market sentiment. No. 1 heavy melting is now quoted at $36 to $37.

Youngstown The scrap market has taken another downturn, prices falling about $2 a ton. Only small sales are reported here, with major consumers out of the market. One steel firm purchased some No. 2 heavy melting steel and No. 2 bundles at $30.

Cincinnati Prices on No. 1 open-hearth grades of scrap have declined $1 per ton. There is no local buying. Middletown also is inactive.

Chicago The scrap market is featureless. It retains most of its recently developed strength, however, and brokers must pay about $1 per ton more than the consumer buying price to get open-hearth grades to fill contracts.

St. Louis The scrap market has subsided after the recent flurry of price advances. Few new orders are being placed. Rail offerings continue light.

Birmingham Little activity is noted in the scrap market. Most cast grades are in short supply because little tonnage is arriving at local yards. Melting steel is not in great demand.

Seattle Buyers report ample scrap receipts from local sources. Reduction of furnace output means a restricted local market. Large consumers are buying as their needs develop.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

320 tons, municipal hospital, Newark, N. J., to Schacht Steel Construction, Inc., New York.

1200 tons, bridges, Long Beach, Long Island, N. Y., through Merrit-Chapman-Scott, New York, to Schacht Steel Construction, Inc., that city.

500 tons, building, Dixie Cup Co., Easton, Pa., to Bethlehem Fabricators, Bethlehem, Pa.

175 tons, three buildings and ramps, Agawam, Springfield, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Daniel O'Connell's Sons Co., Holyoke, Mass., general contractor.

300 tons, construction at Hanford Works, to Bethlehem Pacific Coast Steel Corp., Seattle, by Blaw-Knox Co., prime contractor.

150 tons, alert hangar, air field base, Bedford, Mass., to Grosser & Stiager Iron Works, Somerville, Mass., through George H. Fuller Co., Boston, general contractor.

180 tons, state bridge work, New Jersey, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

175 tons, construction at Hanford Works, to the Gates Co., Idaho, J. H. Hoffman, Portland, Oreg., general contractor.

165 tons, state highway bridges, Billerica, Mass., to Westend Iron Works, Cambridge, Mass., through J. F. White Construction Co., general contractor.

150 tons, shop building, Western Electric Co., Watertown, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

140 tons, office and service building, United Gas Improvement Corp., Reading, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, state highway bridge, Newcastle county, Delaware, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, state bridge, Salem county, New Jersey, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

4000 tons, cable and suspenders, Philadelphia-Gloucester bridge, Delaware River Port Authority, American Bridge Division, U. S. Steel Corp., Pittsburgh, low.

1500 tons or more, gates, beams, The Dalles Project, bids in to the U. S. Engineer, Portland, Oreg.

1400 tons, manufacturing buildings, Western Electric Co., North Andover, Mass.

(Please Turn to Page 160)

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated, with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

THE O. K. TOOL COMPANY, INC.
MILFORD 3, NEW HAMPSHIRE

Steel Ingot Output Rises In October

1953	OPEN-HEARTH Net tons	% of capac-ity	BESSEMER Net tons	% of capac-ity	ELECTRIC Net tons	% of capac-ity	TOTAL Net tons	% of capac-ity	Calculated weekly production (net tons)	No. of weeks in mos.
January	8,841,679	101.4	350,000	88.9	706,083	81.2	9,897,962	99.1	2,234,303	4.43
February	7,939,299	100.8	329,389	92.6	664,091	84.6	8,932,779	99.1	2,233,195	4.00
March	9,050,773	103.7	354,710	90.0	762,615	87.7	10,168,098	101.8	2,295,282	4.43
1st Qtr.	25,831,751	102.0	1,034,299	90.4	2,132,789	84.5	28,998,839	100.0	2,254,964	12.86
April	8,493,909	100.5	334,605	87.7	717,024	85.2	9,545,538	98.7	2,225,067	4.29
May	8,925,163	102.3	354,577	90.0	717,340	82.5	9,997,080	100.1	2,256,677	4.43
June	8,394,502	99.4	332,060	87.0	677,917	80.5	9,404,479	97.2	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	1,021,242	88.3	2,112,281	82.7	28,947,097	98.7	2,224,988	13.01
1st 6 Mo.	51,645,325	101.4	2,055,541	89.3	4,245,070	83.6	57,945,936	99.4	2,239,889	25.87
July	8,316,342	95.5	324,068	82.4	635,263	73.2	9,275,673	93.1	2,098,569	4.42
August	8,463,155	97.0	310,074	78.7	632,351	72.7	9,405,580	94.2	2,123,156	4.43
*Sept.	8,076,277	95.8	287,368	75.6	519,513	61.9	8,883,428	92.1	2,075,567	4.28
*3rd. Quar.	24,855,774	96.1	921,780	78.9	1,787,127	69.4	27,564,681	93.1	2,099,366	13.13
*9 Mos.	76,501,099	99.6	2,977,321	85.8	6,032,197	78.8	85,510,617	97.3	2,192,580	39.00
*Oct.	8,641,000	99.0	325,000	82.5	493,000	56.7	9,459,000	94.7	2,135,000	4.43
4th Qtr.	24,858,497	96.1	922,142	79.0	1,813,614	70.4	27,594,253	93.2	2,101,619	13.13
12 Mos.	76,503,822	99.6	2,977,683	85.9	6,058,684	79.2	85,540,189	97.3	2,193,338	39.00
1952										
1st Qtr.	24,207,329	102.5	1,168,871	87.4	1,824,524	89.1	27,200,724	100.7	2,092,363	13.00
April	7,101,199	91.1	323,006	73.2	567,935	84.1	7,992,140	89.7	1,862,970	4.29
May	7,291,865	90.6	318,642	69.9	595,135	85.3	8,205,642	89.2	1,852,289	4.43
June	1,446,927	18.6	22,862	5.2	170,000	25.2	1,639,789	18.4	382,235	4.29
2nd Qtr.	15,839,991	67.0	664,510	49.6	1,333,070	65.1	17,837,571	66.0	1,371,066	13.01
1st 6 Mo.	40,047,320	84.8	1,833,381	68.5	3,157,594	77.1	45,038,295	83.4	1,731,576	26.01
July	1,347,587	16.8	2,000	0.4	277,859	39.9	1,627,446	17.7	368,200	4.42
August	7,599,888	94.4	309,361	67.8	490,476	84.6	8,499,725	92.4	1,918,674	4.43
Sept.	8,039,128	103.4	351,620	79.8	672,539	99.8	9,063,287	102.0	2,117,590	4.28
3rd Qtr.	16,986,603	71.2	662,981	49.1	1,540,874	74.5	19,190,458	70.4	1,461,573	13.13
9 Mos.	57,033,923	80.2	2,496,362	62.0	4,698,468	76.2	64,228,753	79.0	1,641,000	39.14
Oct.	8,747,640	108.7	347,042	76.1	713,402	102.3	9,808,084	106.2	2,214,014	4.43

Note—The percentages of capacity in 1953 are calculated on weekly capacities of 1,969,275 net tons open-hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953, as follows: Open-hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons. The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons.

*Revised.
†Preliminary figures, subject to revision.

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Nov. 19	$35.00
Nov. 12	35.33
Oct. avg.	32.75
Nov. 1952	43.00
Nov. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*34.00-35.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	21.00-22.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	25.00-26.00
Cast iron borings	24.00-25.00
Cut structurals	40.00-41.00
Heavy turnings	31.00-32.00
Punchings & plate scrap	40.00-41.00
Electric furnace bundles	40.00-41.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	38.00-39.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	33.00-34.00
No. 1 machinery cast	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt	42.00-43.00
Rails, 2 ft and under	*49.00-50.00*
Rails, 18 in. and under	*50.00-51.00*
Rails, random lengths	44.00-45.00
Railroad specialties	44.00-45.00

Stainless Steel Scrap

18-8 bundles & solids	165-170
18-8 turnings	90-95
430 bundles & solids	87-90
430 turnings	60-62

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.00-34.00
No. 2 bundles	27.00-28.00
No. 1 busheling	33.00-34.00
Machine shop turnings	18.00-19.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	34.00-35.00
Alloy free, short shovel turnings	25.00-26.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	41.00-41.00
Charging box cast	31.00-32.00
Stove plate	38.00-39.00
Heavy breakable cast	27.00-28.00
Unstripped motor blocks	26.00-27.00
Brake shoes	*38.00-38.00*
Clean auto cast	46.00-47.00
No. 1 wheels	41.00-42.00
Burnt cast	*32.50-33.00*
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 3-ft and under	50.00-51.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	43.00-44.00
Cast steel	42.00-43.00
Railroad specialties	42.00-43.00
Uncut tires	40.00-41.00
Angles, splice bars	45.00-46.00
Rails, rerolling	49.00-50.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	35.00-36.00
No. 2 bundles	*34.00-35.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	36.00-37.00
Electric furnace bundles	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	35.00
No. 2 heavy melting	32.00
No. 1 bundles	35.00
No. 2 bundles	30.00
No. 1 busheling	35.00
Electric furnace bundles	36.00-37.00
Machine shop turnings	22.00
Mixed borings, turnings	20.50-21.00
Short shovel turnings	25.00
Structurals & plate	*38.50*
Heavy turnings	31.00-31.50
Couplers, springs, wheels	42.00
Rail crops, 2 ft & under	46.00-48.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	nom.
Heavy breakable cast	40.00
Unstripped motor blocks	28.00
Drop broken machinery	42.00-43.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	24.50-25.00
No. 1 bundles	27.00-28.00
No. 2 bundles	22.50-23.50
Machine shop turnings	13.50-14.50
Mixed borings, short turnings	18.00-19.00
Low phos. (structural & plate)	29.50
Short shovel turnings	19.00-20.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	165.00-175.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	80.00-85.00
410 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	23.00-23.50
No. 1 bundles	24.00-25.00
No. 2 bundles	20.50-21.50
Machine shop turnings	13.00-13.50
Mixed borings, turnings	15.50-16.00
Short shovel turnings	16.50-17.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	28.00-29.00
No. 1 bundles	*32.00-33.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*32.00-33.00*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Low phos., 18-in.	36.00-40.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Charging box cast	35.00
Drop broken machinery	46.00

Railroad Scrap

No. 1 R.R. heavy melt	34.00-35.00
Malleable	42.00-43.00
Rails, 18-in. and under	48.00-49.00
Rails, random lengths	39.00-40.00

CHICAGO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	32.00-34.00
No. 2 bundles	26.00-27.00
No. 1 busheling	33.00-34.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3-ft	37.00-38.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	36.00-37.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Stove plate	24.00-30.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	*38.00-40.00*
Drop broken machine	*38.00-40.00*

Railroad Scrap

No. 1 R.R. heavy melt	35.00-36.00
R.R. Malleable	40.00-41.00
Rails, 2 ft and under	*46.00-48.00*
Rails, 18 in. and under	*48.00-50.00*
Angles, splice bars	40.00-42.00
Rails, rerolling	*48.50-49.50*

Stainless Steel Scrap

18-8 clips & solids	140.00-160.00
18-8 turnings	nom. 70.00
430 clips & solids	70.00
430 turnings	*nom. 50.00*

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	29.00
No. 2 heavy melting	23.00
No. 1 bundles	29.00
No. 2 bundles	23.00
No. 1 busheling	29.00
Machine shop turnings	14.00
Mixed borings turnings	14.00
Short shovel turnings	15.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	40.00
Malleable	40.00

BUFFALO

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	31.00-31.50
No. 1 bundles	34.00-35.00
No. 2 bundles	29.00-29.50
No. 1 busheling	34.00-35.00
Machine shop turnings	21.50-22.50
Mixed borings, turnings	23.50-24.00
Short shovel turnings	24.50-25.00
Cast iron borings	23.50-24.00
Low phos.	38.00-39.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	34.00-35.00
No. 1 machinery	39.00-40.00

Railroad Scrap

Rails, random lengths	41.00-42.00
Rails, 2 ft and under	46.00-47.00
Railroad specialties	44.00-45.00

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.50
Short shovel turnings	20.50-21.50
Cast iron borings	20.50-21.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	33.00
No. 2 bundles	27.00-28.00
Machine shop turnings	14.00-15.00
Short shovel turnings	15.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	29.00-30.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	29.00-30.00
Brake shoes	37.00-38.00
Clean auto cast	39.00-40.00
Burnt cast	31.00-32.00

Railroad Scrap

Malleable	37.00-38.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	41.00-42.00
Rails, rerolling	48.00-49.00
Uncut tires	33.00-34.00
Angles, splice bars	37.00-38.00

SEATTLE

(delivered consumer plant)

No. 1 heavy melting	21.00
No. 2 heavy melting	27.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	12.00-12.50
Short shovel turnings	12.00-12.50
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	11.00
Cast iron borings	11.00
Cut structurals	28.00
Heavy turnings	11.00
Punchings & plate scrap	28.00
Electric furnace bundles	22.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00

HAMILTON, ONT.

(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	22.50
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

Cast Iron Grades†

No. 1 machinery cast	46.00

†F.o.b., shipping point.

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(Concluded from Page 157)

2500 tons, maintenance hangar, Westover Air Field, Chicopee, Mass., again out for bids. U. S. Engineer, Boston.

2000 tons, state office building, Harrisburg, Pa., John McShain Inc., Philadelphia, low on general contract. Also required are 1700 tons of reinforcing bars.

1600 tons, 16 multi-purpose hangars, Westover Air Field, Chicopee, Mass., T. C. Bateson Construction Co., Dallas, Tex., general contractor.

800 tons, state bridge, White Clay creek, Newcastle county, Delaware, bids Dec. 2.

500 tons, fuel element pilot plant, Hanford Works, bids to Atomic Energy Commission, Richland, Wash., Dec. 17.

240 tons, substation steel, bids in to Bonneville Power Administration, Portland, Oreg.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, Washington state overpass, Skagit county, and commercial building, Seattle, to Soule Steel Co., Seattle.

175 tons, officers' mess, Ft. Richardson, Alaska, Warrack Construction Co., general contractor, and Richardson highway bridge, Alaska, Morrison-Knudsen Co., Seattle, general contractor, to Bethlehem Pacific Coast Steel Co., Seattle.

REINFORCING BARS PENDING

Unstated, factory, $1 million state office building, bids to Olympia, Wash., Dec. 22.

Unstated, garage structure, Seattle, for Frederick & Nelson department store, bids soon.

Unstated, 3-million gal. concrete reservoir, bids to Pasco, Wash., Dec. 10.

Unstated, $500,000, orthopedic hospital, Tacoma, Wash., bids soon.

Unstated, Montana state highway projects: 128-ft. steel-concrete overpass, Park county, and 2,240-ft. steel-concrete bridge, Phillips county, bids to Helena, Mont., Nov. 24.

PLATES . . .

PLATES PLACED

780 tons, including shapes, Army fuel tanks, Ladd Field, Alaska, to Consolidated Western Steel Corp., Seattle; Morrison-Knudsen Co., Seattle, general contractor.

100 tons, culvert work, Juneau highway, Alaska, to Beall Pipe & Tank Corp., Portland, Oreg.; Morrison-Knudsen Co., Seattle, general contractor.

PLATES PENDING

15,000-20,000 tons, tanks and other structures, Shell Oil Co.'s proposed refinery, Anacortes, Wash., bid call expected soon.

240 tons, twelve 50,000-gal. capacity welded underground tanks, Corps of Army Engineers, Philadelphia, bids Nov. 30.

150 tons, elevated water tank of approximately 300,000-gal. capacity, Veterans Administration hospital, Coatesville, Pa., bids Dec.

PIPE . . .

CAST IRON PIPE PENDING

475 tons, mostly 24-inch, state department of public works, contractors letting, Lowell, Mass., bids in.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Louisville & Nashville, 55 diesel units, with seven 1,750-hp. general purpose engines to be built by the Electro-Motive Division, General Motors Corp., La Grange, Ill., and forty-six 1,000-hp. general purpose units and two 1,600-hp. road freight units to be built by the American Locomotive Co., New York.

LOCOMOTIVES PENDING

Virginian, 25 diesel locomotives, bids asked.

RAILROAD CARS PLACED

Erie, ten 50-ton box cars, to Pullman Standard Car Mfg. Corp., Chicago.

New Haven, three 200-ton transfer cars, to own shops.

Northern Pacific, two sleepers, to Pullman Standard Car Mfg. Corp., Chicago.

St. Louis-San Francisco, 600 fifty-ton box cars to Pullman Standard Car Mfg. Corp., Chicago.

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Tank, 8,000-Gallon, Coiled and Non-Coiled

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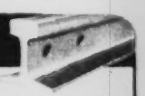

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Reply Box 846, STEEL
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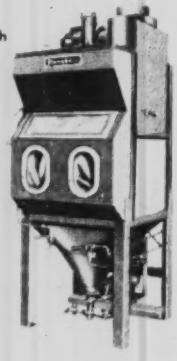
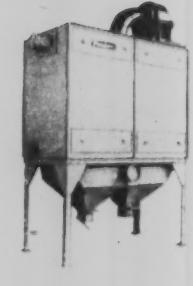


Pangborn Hydro-Finish Cabinet Removes scale and directional grinding lines . . . holds tolerances to .0001" and prepares surfaces for painting or plating. Liquid blast reduces costly hand cleaning and finishing of molds, dies, tools, etc. Models from **$1410** and up.

AND DUST CONTROL



Pangborn Unit Dust Collector Traps dust at the source. Machine wear and tear is minimized, housekeeping and maintenance costs reduced. Solves many grinding and polishing nuisances and allows reclamation of valuable material. Models from **$286** and up.

Pangborn Blast Cleaning Machines for cleaning tanks, bridges, structures quickly and economically. Portable and stationary models, 6 sizes . . . $188 and up. Cabinet for cleaning small metal parts better and faster . . . $319 and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn

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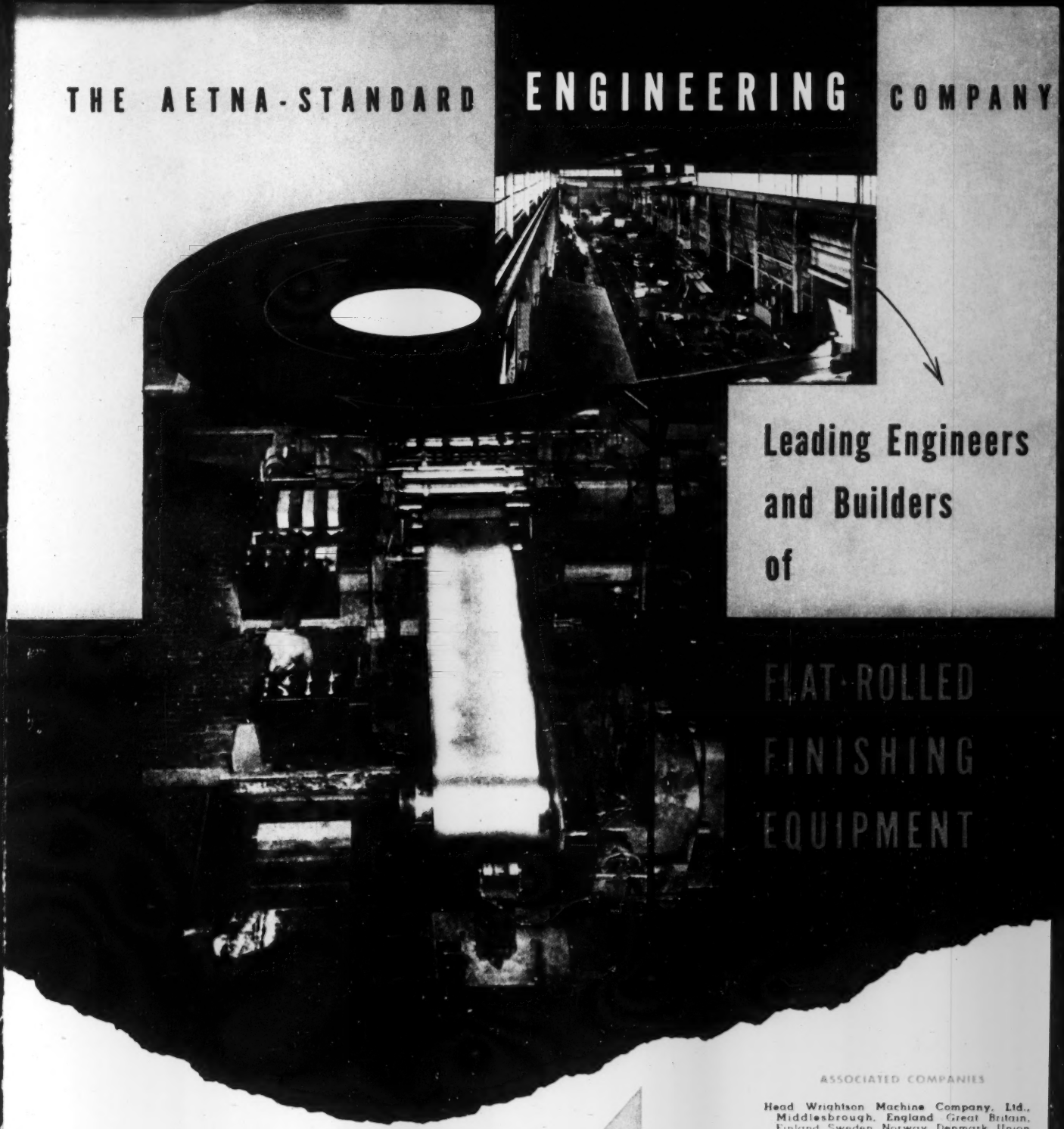

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THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Plants in Warren, Ohio · Ellwood City, Pennsylvania

New tapered bore TIMKEN® bearing in new midwestern mill has interference fit—yet is easy to remove

THE Timken TQIT bearing is the world's first 4-row tapered roller bearing with a tapered bore. It combines maximum bearing capacity and interference fit with easy removal. Now in service on a midwestern steel company's new 21″ x 56″ x 72″, 4-Hi Temper Pass Mill, this Timken® bearing has a bore of 32.625″, an O.D. of 45″, and a width of 32½″.

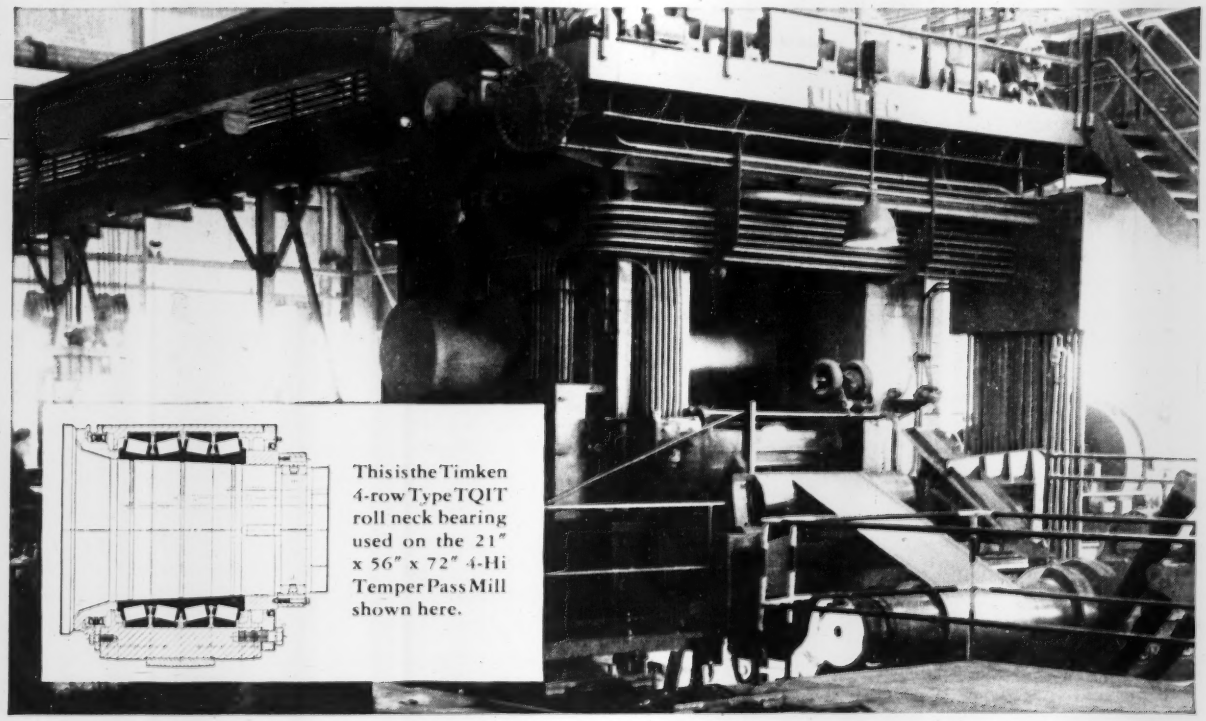
This bearing can be quickly removed from the roll neck by expanding its cones hydraulically. Excessive scuffing and neck wear are eliminated. The interference fit cone provides greater stability between the cone and the neck. It also gives better load distribution not only between the four rows of rollers in the bearing but also to the various rollers within each row. This easily serviced installation permits improved fillet contours and larger necks. Result: lower neck stress and deflections than any other arrangement that can be used.

Of course, like other Timken roll neck bearings, this new tapered bore Timken bearing permits maximum roll neck size and greater mill rigidity. It also eliminates the need for special thrust bearings and makes possible higher rolling mill speeds. Mills can be stopped and started without the loss of steel.

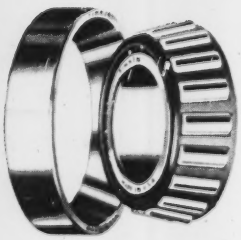
Always specify Timken bearings for the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.

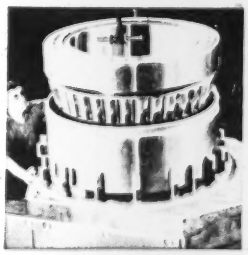


This is the Timken 4-row Type TQIT roll neck bearing used on the 21″ x 56″ x 72″ 4-Hi Temper Pass Mill shown here.



TIMKEN

TAPERED ROLLER BEARINGS



ROLL NECK BEARING ENGINEERING SERVICE

Our field service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION